VETERINARY MATERIA MEDICA

SIXTH EDITION

PARKE, DAVIS & CO.,
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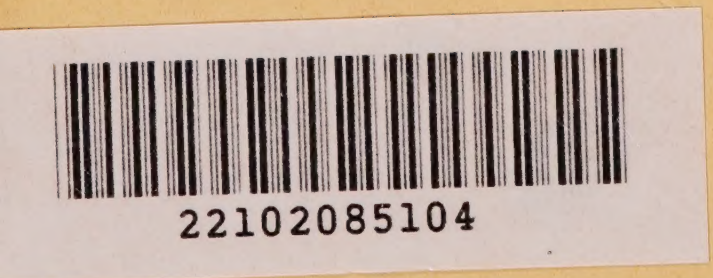
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Veterinary Materia Medica

SIXTH EDITION

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PREFACE.

IT is almost exactly twenty years since the first edition of Parke, Davis & Co.'s VETERINARY MATERIA MEDICA was issued, and during that period five large editions have been published. The book has always been popular with the veterinary profession, and since the fifth edition, which appeared in 1921, went out of print, we have received very numerous and urgent requests for a new edition ; accordingly, this, the sixth edition, is now issued.

The Index of Therapeutics, which has been found so convenient in the past, has been retained, as well as the General Index. Some preparations that are no longer of interest to the profession have been discontinued, while others have been introduced. Among the latter are the new anthelmintics—Carbon Tetrachloride (CCl_4) and Tetrachlorethylene (C_2Cl_4). The former has been found specific as a remedy for fluke or liver-rot, very many thousands of sheep having been treated successfully with P., D. & Co. capsules during the last two years. We have, however, found it desirable to issue a caution to veterinarians that its administration to folded sheep, or to sheep on special feedings, may be followed by fatalities. The drug, however, appears to be perfectly safe for sheep grazed on natural pasture.

Tetrachlorethylene (labelled " Nema " for convenience) is a most effective vermifuge for cats, dogs, sheep and swine, and it is believed to be practically safe.

Capsules of Chloretone and Belladonna Compound have been introduced ; these have been found of great service in the treatment of chorea in dogs.

All our preparations are obtainable through any pharmacist, or direct from us. In prescribing or ordering it is well to specify " P., D. & Co." No prices are quoted in this book, but a separate price list gives full particulars as to terms (see pocket on page 3 of cover).

We desire to state further, that this book is issued to members of the veterinary profession only.

PARKE, DAVIS & CO.

December, 1927.

INDEX OF THERAPEUTICS.

This Index does not profess to make mention of all the remedies that might be employed to treat the disorders referred to. It is devised for the convenience of the veterinary surgeon who may wish to learn what preparations mentioned in this volume are adapted for use in the treatment of any given disorder, and the pages on which further particulars of those preparations may be found.

ABBREVIATIONS.

C.T.	= Compressed Tablet.	Oint.	= Ointment.
C.C.T.	= Chocolate-coated Tablet.	P.E.	= Powdered Extract.
Comp.	= Compound.	Sol.	= Solution.
Elix.	= Elixir.	Suppos.	= Suppositories.
Emuls.	= Emulsion.	Syr.	= Syrup.
F.E.	= Fluid Extract.	T.T.	= Tablet Triturate.
H.T.	= Hypodermic Tablet.	V.H.T.	= Veterinary Hypodermic Tablet
L.E.	= Liquid Extract.	Vet.	= Veterinary.

ABORTION.

To prevent.—Liquor Sedans (p. 68).

Vaginal douche of diluted Hydrogen Peroxide Sol. (p. 110) or of solution of Antiseptic C.T. (p. 101), to prevent sepsis.

ABORTION, CONTAGIOUS.

Disinfect genital organs of both cow and bull with solution of Antiseptic C.T. (p. 101), Mercuric Iodide C.T. (p. 112), Germicidal Soap (p. 109), or solution of Dibromin (p. 104).

Abrasions, see "Wounds."

ABSCESSES.

Subcutaneously.—Nuclein (p. 74) concurrently with Mixed Infection Phylacogen, Equine (p. 31), Streptococcus-Staphylococcus Bacterin, Equine (p. 21), or Antistreptococcic Serum, Equine (p. 7).

Orally.—Echinacea F.E. (p. 65).

Locally.—To promote maturation, apply Thermofuge, Vet. (p. 117) or surround the site with coating of Capsolin (p. 103) or Blistering Ointment, Vet. (p. 102).

Surgical evacuation under analgesia with Apothesine (p. 121), Quinine and Urea (p. 127), or 'Codrenine' (p. 125), followed by irrigation with diluted Fecto (p. 108) or Hydrogen Peroxide Sol. (p. 110) or solution of Dibromin (p. 104).

Antiseptic dressings: Emollientine (p. 105), Chloretone Comp. Oint. (p. 104), ointment compounded with Mercuric Iodide C.T. (p. 112).

In abdominal or renal abscesses.—Colon Bacterin (p. 19).

In interdigital abscess of the dog.—Staphylococcus-Streptococcus Bacterin, Canine (p. 20), Nuclein (p. 74), Metagen (p. 69), Metagen and Cod-Liver Oil Emulsion (p. 71).

ACTINOMYCOSIS.

Orally.—Mercuric Iodide C.T. (p. 112). Spray mouth and throat with diluted Hydrogen Peroxide Sol. (p. 110) by means of the 'Glaseptic' Spray (p. 113).

Subcutaneously.—Actinomycosis Vaccine (p. 24). In case of purulent complications: Antistreptococcic Serum, Equine (p. 7), Mixed Infection Phylacogen, Equine (p. 31), or Streptococcus-Staphylococcus Bacterin, Equine (p. 21). Nuclein (p. 74).

AMENORRHŒA.

Mugwort F.E. (p. 66).

ANÆMIA.

Orally.—Hematic Hypophosphites (p. 68), Easton Syrup C.T. (p. 84), Iron and Arsenic T.T. (p. 84), Triple Glycerophosphates C.C.T. (p. 87), Echinacea F.E. (p. 65).

Subcutaneously.—Sodium Cacodylate Sol. (p. 91).

ANÆMIA, INFECTIOUS.

Subcutaneously.—Sodium Cacodylate Sol. (p. 91) concurrently with Nuclein (p. 74). Anti-Influenza Serum (p. 6).

Anasarca, see "Dropsy."

ANTHRAX.

For prophylaxis.—Inoculation with 'Anthraxoids' (p. 24). Anti-Anthrax Serum (p. 5) should also be given if the animal has been exposed to infection.

For treatment.—Anti-Anthrax Serum (p. 5).

Anthrax, Symptomatic, see "Blackleg."

ANURIA and DYSURIA.

Orally.—Saw Palmetto F.E. (p. 67), Buchu Liq. (p. 64).

Subcutaneously.—Pituitrin (p. 51).

ARTHRITIS.

Subcutaneously.— Streptococcus - Staphylococcus Bacterin, Equine (p. 21), Mixed Infection Phylacogen, Equine (p. 31). Camphor in Oil (p. 90). Nuclein (p. 74).

Orally.—Aspirin C.T. (p. 82), Aspirin compound with Dover Powder C.T. (p. 82).

Topically.—Thermofuge, Vet. (p. 117), Capsolin (p. 103).

Arthritis, Septic, see "Umbilical Infection."

Ascites, see "Dropsy."

ASTHMA.

Orally.—Cocillana Comp. Syr. (p. 60), Squill Normal Liquid (p. 73), Terpin Hydrate and Diamorphine C.C.T. (p. 86).

Subcutaneously.—Adrenalin Chloride Sol. (p. 44), Morphine H.T. (p. 96), Morphine and Atropine H.T. (p. 96), Apomorphine Hydrochloride H.T. (p. 93). Also see "Dyspnœa."

ATROPHY.

Locally.—Capsolin (p. 103), Blistering Oint. Vet. (p. 102), Thermofuge (p. 117), Adrenalin Oint. (p. 101).

Orally.—Tonic Pill (p. 80), Nuclein (p. 74).

Improve nutrition, see "Malnutrition."

Azoturia, see "Hæmoglobinuria."

BLACKLEG (Black Quarter).

For prophylaxis.— Inoculation with "Blacklegoids" (p. 25), Blackleg Aggressin (p. 27) or Blackleg Filtrate (p. 28) prior to the blackleg season.

For treatment.—Hydrogen Peroxide Sol. (p. 110).

BOILS.

Subcutaneously.—Nuclein (p. 74), Staphylococcus-Streptococcus Bacterin, Canine (p. 20) or Mixed Infection Phylacogen, Equine (p. 31).

Orally.—Mercuric Iodide C.T. (p. 112), Echinacea F.E. (p. 65), Cascarin Comp. Condition Powder (p. 57).

Locally.—Thermofuge, Vet. (p. 117). Surround with a coating of Capsolin (p. 103) or Blistering Oint. Vet. (p. 102). Solution of Dibromin (p. 104).

Broken Knees, see "Wounds."

Broken Wind, see "Emphysema."

BRONCHITIS.

Orally.—Cocillana Comp. Syr. (p. 60), Equine Cough Syr. (p. 62), Squill, Normal Liquid (p. 73), Terpin Hydrate and Diamorphine C.C.T. (p. 86), Chlor-Anodyne, Vet. (p. 58), Cod-Liver Oil Emuls. (p. 61), Bronchitis T.T. (p. 82).

Subcutaneously.—Anti-Influenza Serum, Equine (p. 6), Pneumonia Phylacogen, Equine (p. 34), Antistreptococcic Serum, Equine (p. 7), Atropine H.T. (p. 94), Apomorphine Hydrochloride H.T. (p. 93).

Throat spray.—Chloretone Inhalant (p. 103), Neo-Protosil Solution (p. 114).

Externally.—Capsolin (p. 103), Thermofuge, Vet. (p. 117).

BURNS and SCALDS.

Apply lint saturated with Chloretone Inhalant (p. 103) promptly, subsequently dress with Boroseptic Oint. (p. 102) or Scarlet Red Oint. (p. 116). If shock is present, treat as indicated under that heading.

If suppurating, cleanse with Hydrogen Peroxide Sol. (p. 110), apply Emollientine (p. 105) and give injections of Nuclein (p. 74) concurrently with Streptococcus-Staphylococcus Bacterin (p. 21) or Mixed Infection Phylacogen, Equine (p. 31).

BRUISES.

Compress of Lead and Opium C.T. (p. 85). Thermofuge. Vet. (p. 117).

CALCULUS.

Surgical measures under analgesia with Apothesine (p. 121), 'Codrenine' (p. 125) or Quinine and Urea (p. 127).

Orally.—Cystitis C.C.T. (p. 83). Chlor-Anodyne (p. 58) or Morphine H.T. (p. 96) for pain.

Canine Typhus, see "Gastro-Enteritis, Contagious."

CANKER OF THE EAR.

Soften scab with warm Liquid Petrolatum, remove with swab dipped in hot solution of Germicidal Soap (p. 109), irrigate with Hydrogen Peroxide Sol. (p. 110) or dilution of Fecto (p. 108) and apply Emollientine (p. 105), 5% to 10% solution of Neo-Protosil (p. 114) or of Protosil (p. 115), Neo-Protosil Ointment (p. 115) or Storaxol (p. 116), or Soft Germicidal Soap (p. 109).

Subcutaneously.—Staphylococcus-Streptococcus Bacterin, Canine (p. 20).

CAPPED HOCK.

Application of Thermofuge, Vet. (p. 117), Capsolin (p. 103), Germicidal Soap, Soft (p. 109).

Catarrh, Nasal, see "Coryza."

Catarrhal Fever, see "Influenza."

CELLULITIS.

Subcutaneously.—Nuclein (p. 74) concurrently with Antistreptococcic Serum, Equine (p. 7), or Streptococcus-Staphylococcus Bacterin, Equine (p. 21). To support the heart, Camphor in Oil (p. 90).

Orally.—Mercuric Iodide C.T. (p. 112).

Chafes, see "Wounds."

Cholera, Hog, see "Swine Fever."

CHOREA.

Orally.—Chloretone (p. 59) or Chloretone and Belladonna Comp. Caps. (p. 54), Bromide and Chloral Comp. Elix. (p. 54), Parathyroid Gland C.T. (p. 42), Hyoscyamus F.E. (p. 65), Valerian, Ammoniated Liq. (p. 67), Cod-Liver Oil Emuls. (p. 61), Hematic Hypophosphites (p. 68).

Externally.—Capsolin (p. 103) over the seat of twitching. Flavolin (p. 109).

CHOKING.

Displacement of a foreign body is often accomplished by the hypodermic injection of Apomorphine Hydrochloride H.T. (p. 93) for emesis, Atropine H.T. (p. 94) for overcoming œsophageal spasm, Arecoline Hydrobromide V.H.T. (p. 93), Physostigmine Comp. V.H.T. (p. 97) or Physostigmine and Pilocarpine V.H.T. (p. 97).

COLIC and TYMPANITES.

Subcutaneously.—Arecoline Hydrobromide V.H.T. (p. 93), Arecoline Comp. V.H.T. (p. 94), Physostigmine Comp. V.H.T. (p. 97) or Physostigmine and Pilocarpine V.H.T. (p. 97) to unload bowel. Scopolamine and Morphine H.T. (p. 97), Morphine and Atropine Sol. (p. 96), for pain.

Orally.—Ginger F.E. (p. 65), Chlorodyne C.T. (p. 83), Bromide and Chloral Comp. Elix. (p. 54), Chlor-Anodyne, Vet. (p. 58). In small animals: Rhubarb Comp. Liq. (p. 67), Taka-Diastase Sedative Elix. (p. 88), Chloretone (p. 59).

Externally.—Apply hot Thermofuge, Vet. (p. 117), Capsolin (p. 103) or equal parts of Aconite F.E. (p. 63) and soap liniment.

COLITIS.

Orally.—Salol C.T. (p. 86).

Subcutaneously.—Colon Bacterin (p. 19).

Intestinal lavage.—1 in 1000 to 1 in 700 solution of Protosil (p. 115).

Collapse, see "Shock."

CONJUNCTIVITIS.

Instillations.—Adrenalin Chloride Sol. (p. 44), 'Codrenine' (p. 125), Hydrogen Peroxide Sol. (p. 110), Protosil (p. 115) or Zinc Sulphate C.T. (p. 87). Neo-Protosil Ointment (p. 115).

'*Oculets*.'—Adrenalin (p. 78), Corrosive Sublimate (p. 78), Zinc and Cocaine (p. 79).

CONSTIPATION.

Aloetic Physic Ball (p. 53), Aloin (p. 53), Cascara F.E. (p. 64), Cascara Evacuant (p. 57), Cathartic Comp. Pill (p. 80). For small animals, Glycerin Suppositories (p. 68) may be useful.

Post-operative.—Pituitrin (p. 51), subcutaneously.

CONVULSIONS.

Orally.—Bromide and Chloral Comp. Elix. (p. 54), Chloretone and Belladonna Comp. Caps. (p. 54).

Subcutaneously.—Veratrone (p. 92).

Also see "Chorea" and "Eclampsia."

Corneal Ulcer, see "Ulcer, Corneal."

CORYZA (Nasal Catarrh).

Subcutaneously.—Nuclein (p. 74) and/or Streptococcus - Staphylococcus Bacterin, Equine (p. 21), also local measures as follows:

Nebulæ.—Chloretone Inhalant (p. 103), by means of the 'Glaseptic' Nebuliser (p. 113), or Adrenalin Chloride Sol. (p. 44) by means of the 'Glaseptic' Spray (p. 113).

Douches.—Solution of Nasoral or C.T. (p. 85), Hydrogen Peroxide Sol. (p. 110), 5% solution of Protosil (p. 115) or of Neo-Protosil (p. 114).

Application to nares.—Adrenalin and Chloretone Oint. (p. 101).

In chronic coryza of aged dogs, Thyroid Gland, Desiccated (p. 41) may be beneficial.

Cough, see "Bronchitis" and "Laryngitis."

Cracked Heels, see "Fissure."

CURB.

Apply Thermofuge, Vet. (p. 117), Blistering Oint. Vet. (p. 102) or Capsolin (p. 103).

Cuts, see "Wounds."

CYSTITIS.

Orally.—Cystitis C.C.T. (p. 83), Buchu Liq. (p. 64), Saw Palmetto F.E. (p. 67), Saw Palmetto and Santal Comp. Elix. (p. 81), Aconite F.E. (p. 63). Cannabis Indica (p. 73) for pain, Salol C.T. (p. 86) or Hexamine C.T. (p. 84) to disinfect the urine.

Vesical injection.—Solution of Protosil (p. 115), Solution of Dibromin (p. 105).

Subcutaneously.—Streptococcus-Staphylococcus Bacterin (p. 21), Colon Bacterin (p. 19).

Externally.—Thermofuge, Vet. (p. 117).

In case of hæmaturia, treat as indicated under that heading.

DEBILITY.

Orally.—Cod-Liver Oil Emuls. (p. 61), Hematic Hypophosphites (p. 68), Metagen and Cod-Liver Oil Emulsion (p. 71), Nux Vomica L.E. (p. 66), Tonic Pill (p. 80), Easton Syrup C.T. (p. 84).

Also see "Malnutrition" and "Impotence."

DERMATITIS.

Orally.—Cascarin Comp. Condition Powder (p. 57), Mercuric Iodide C.T. (p. 112).

Subcutaneously.—Sodium Cacodylate Sol. (p. 91).

Topically.—Storaxol (p. 116), Emollientine (p. 105), Boroseptic Oint. (p. 102). Germicidal Soap (p. 109). Solution of Lead and Opium C.T. (p. 85) or Lead Subacetate C.T. (p. 85). Thermofuge, Vet. (p. 117).

DIARRHŒA.

Orally.—Liquid Catechu (p. 64), Hamamelis L.E. (p. 65), Dover Powder T.T. (p. 84), Aromatic Chalk C.T. (p. 82). Rhubarb Comp. Liq. (p. 67) for small animals. Chlor-Anodyne (p. 58) for dogs.

Chronic.—Colon Bacterin (p. 19), Salol C.T. (p. 86).

Also see "Dysentery" and "White Scour."

Bacillary Diarrhœa of Chickens, Fecto (p. 108).

DISTEMPER, CANINE.

Prophylaxis.—Canine Distemper Mixed Bacterin (p. 16). If the animal has been exposed to infection, a dose of Antidistemper Serum (p. 5) should be given two days before commencing the Bacterin treatment, and also with each dose of the Bacterin. Canine Distemper Immunogen (p. 23).

Treatment.—Antidistemper Serum (p. 5), preferably with concurrent doses of Canine Distemper Mixed Bacterin (p. 16) or Canine Distemper Immunogen (p. 23) and such of the following measures as the symptoms may indicate. Hydrogen Peroxide Sol. (p. 110).

To combat the infection and fever.—Nuclein (p. 74) and/or Antistreptococcic Serum, Equine (p. 7), Aspirin C.T. (p. 82) or Aspirin Compound and Dover Powder C.T. (p. 82).

To support the heart.—Caffeine H.T. (p. 94), Camphor in Oil (p. 90).

For nervous symptoms.—Chloretone (p. 59), Bromide and Chloral Comp. Elix. (p. 54), Easton Syrup C.T. (p. 84), Iron, Quinine and Strychnine C.C.T. (p. 84), Chloretone and Belladonna Compound Caps. (p. 54), Parathyroid Gland (p. 42).

For cough.—Cocillana Comp. Syr. (p. 60).

For diarrhœa and tenesmus.—Dover Powder T.T. (p. 84) or Chlor-Anodyne, Vet. (p. 58).

Also see "Gastritis."

For nasal discharge.—Chloretone Inhalant (p. 103), Boroseptic Oint. (p. 102), Emollientine (p. 105).

For the eyes.—Neo-Protosil Oint. (p. 115).

To maintain strength and hasten convalescence.—Cod-Liver Oil Emuls. (p. 61), Triple Glycerophosphates C.C.T. (p. 87), Metagen and Cod-Liver Oil Emuls. (p. 71), Hematic Hypophosphites (p. 66), Nucleo-Proteid Comp. C.C.T. (p. 85).

DROPSY (Ascites).

Orally.—Digitalis, Normal Liquid (p. 73).

Subcutaneously.—Caffeine H.T. (p. 94), Pituitrin (p. 51), Pilocarpine Hydrochloride V.H.T. (p. 97), Digitalin V.H.T. (p. 95).

After paracentesis.—Inject Adrenalin Chloride Sol. (p. 44) into the cavity to restrain further effusion.

In anasarca.—Streptococcus - Staphylococcus Bacterin (p. 21).

DYSENTERY.

Subcutaneously.—Colon Bacterin (p. 19).

Orally.—Chlor-Anodyne, Vet. (p. 58), Dover Powder T.T. (p. 84), Salol C.T. (p. 86).

Externally.—Capsolin (p. 103).

In hæmorrhage.—Injection of Adrenalin Chloride Sol. (p. 44), diluted.

Dyspepsia, see "Indigestion."

DYSPNŒA.

Subcutaneously.—Strychnine H.T. (p. 98).

Orally.—Lobelia F.E. (p. 66), Belladonna L.E. (p. 64).

Also see "Asthma" and "Emphysema."

Dysuria, see "Anuria."

ECCHYMOSIS.

Compress of solution of Lead and Opium C.T. (p. 85).

ECLAMPSIA.

Subcutaneously.—Veratrone (p. 92), Morphine H.T. (p. 96), Pilocarpine H.T. (p. 97).

Orally.—Bromide and Chloral Comp. Elix. (p. 54), Chloretone (p. 59), Jaborandi F.E. (p. 66).

ECZEMA.

Subcutaneously.—Streptococcus-Staphylococcus Bacterin, Equine (p. 21), or Staphylococcus-Streptococcus Bacterin, Canine (p. 20), which may usefully be alternated with Nuclein (p. 74) or Mixed Infection Phylacogen, Equine (p. 31). These remedies should be supported by the use of local antiseptics and parasiticides, and, perhaps, alterative medicine.

Antiseptic and parasiticide applications.—Mercuric Iodide C.T. (p. 112), Lead Subacetate C.T. (p. 85) or Silver Nitrate C.T. (p. 86). Ethereal Antiseptic Soap (p. 106), Hydrogen Peroxide Sol. (p. 110), Germicidal Soap (p. 109), Boroseptic Oint. (p. 102), Chloretone Comp. Oint. (p. 104), Emollientine (p. 105), Storaxol (p. 116).

Alteratives.—Mercuric Iodide C.T. (p. 112), Cod-Liver Oil Emuls. (p. 61), Echinacea F.E. (p. 65). Thyroid Gland (p. 41). Cascarin Comp. Condition Powder (p. 57), orally. Sodium Cacodylate Sol. (p. 91), subcutaneously.

EMPHYSEMA, PULMONARY.

Diagnosis.—Adrenalin Chloride Sol. (p. 44).

Treatment.—Benzoin Comp. Liq. (p. 64), Lobelia F.E. (p. 66).

EMPYEMA.

Subcutaneously.—Streptococcus-Staphylococcus Bacterin (p. 21).

After incision and drainage.—Wash out cavity with solution of Protosil (p. 115) or of Dibromin (p. 104).

ENTERITIS.

Subcutaneously.—Colon Bacterin (p. 19), Mixed Infection Phylacogen, Equine (p. 31). Aconitine H.T. (p. 93). Morphine H.T. (p. 96) or Morphine and Atropine H.T. (p. 96) for pain.

Orally.—Chlor-Anodyne, Vet. (p. 58) or Cannabis Indica, Normal Liquid (p. 73) for pain. Salol C.T. (p. 86) as intestinal antiseptic.

Intestinal lavage.—Solution of Protosil (p. 115) or Neo-Protosil (p. 114).

Externally.—Capsolin (p. 103) or Thermofuge (p. 117).

EPISTAXIS.

Hypodermically.—Hemoplastin (p. 14), Pituitrin (p. 51), Ergot Aseptic (p. 62).

Nasal douche.—Adrenalin Chloride Sol. (p. 44), or Hamamelis L.E. (p. 65), diluted, solution of tannic acid, Hydrogen Peroxide Sol. (p. 110), by means of the 'Glaseptic' Spray (p. 113).

Internally.—Ergot, Normal Liquid (p. 73).

Topically.—If the site is accessible, apply Adrenalin Chloride Sol. (p. 44) on a wool-tipped probe, with pressure. If necessary, plug with gauze saturated with the Adrenalin solution.

ERYSIPELAS.

Subcutaneously.—Streptococcus-Staphylococcus Bacterin (p. 21) or Antistreptococcic Serum, Equine (p. 7) alternately with Nuclein (p. 74). Aconitine H.T. (p. 93).

Orally.—Aconite F.E. (p. 63), Calomel T.T. (p. 83).

Topically.—Emollientine (p. 105). Compresses with Solution of Neo-Protosil (p. 114) or of Dibromin (p. 104).

ERYTHEMA.

Boroseptic Oint. (p. 102). Compresses of solution of Lead and Opium C.T. (p. 85). Dust with Camphalum (p. 102). Apply Thermofuge (p. 117). Give saline aperients.

EXOSTOSIS.

Thermofuge (p. 117). Capsolin (p. 103) or Blistering Oint., Vet. (p. 102) or solution of iodine or Mercuric Iodide C.T. (p. 112), orally, to promote absorption.

Farcy, see "Glanders."

FAVUS.

Storaxol (p. 116), Emollientine (p. 105), Germicidal Soap, Soft (p. 109).

Also see "Ringworm."

FEBRILE DISORDERS, ACUTE.

Subcutaneously.—Nuclein (p. 74), Aconitine H.T. (p. 93), Veratrone (p. 92).

Orally.—Aconite F.E. (p. 63), Cinchona Liq. (p. 64), Aspirin Compound with Dover Powder (Modified) C.T. (p. 82).

FISSURES.

Cleanse with Hydrogen Peroxide Sol. (p. 110), diluted Fecto (p. 108), Solution of Dibromin (p. 104) or solution of Germicidal Soap (p. 109), and apply Boroseptic Oint. (p. 105), Emollientine (p. 105), or Scarlet Red Oint. (p. 116). Camphalum (p. 102).

FISTULA.

Subcutaneously.—Nuclein (p. 74) alternated with Streptococcus-Staphylococcus Bacterin, Equine (p. 21), Mixed Infection Phylacogen, Equine (p. 30) or Antistreptococcic Serum, Equine (p. 7). For anal fistula, Colon Bacterin (p. 19) is indicated.

Surgical treatment under analgesia from Apothesine (p. 121), Quinine and Urea Sol. (p. 127), or 'Codrenine' (p. 125). Irrigate with diluted Fecto (p. 108) or Hydrogen Peroxide Sol. (p. 110) or Solution of Dibromin (p. 104), and dress with Germicidal Soap, Soft (p. 109), or an ointment compounded with Mercuric Iodide C.T. (p. 112). The oral administration of Echinacea F.E. (p. 65) is said to be a useful auxiliary to the above measures.

FLUKE DISEASE.

Male Fern, Liquid Extract (p. 69). Carbon Tetrachloride Caps. (p. 56).

Founder, see "Laminitis."

Furunculosis, see "Boils."

GAPES IN FOWLS.

Hydrogen Peroxide Sol. (p. 110), diluted and sprayed into the nostrils and throat by means of the 'Glaseptic' Spray (p. 113).

Garget, see "Mammitis."

GASTRITIS.

Orally.—Chloretone (p. 59), Bromide and Chloral Comp. Elix. (p. 54). Taka-Diastase Sedative Elix. (p. 88), Bismuth and Soda C.T. (p. 82).

Subcutaneously.—Morphine H.T. (p. 96). Careful dieting.

GASTRODYNIA.

Orally.—Chlor-Anodyne, Vet. (p. 58), Chlorodyne C.T. (p. 83), Chloretone (p. 59).

Externally.—Capsolin (p. 103) or Thermofuge (p. 117).

GASTRO-ENTERITIS, CONTAGIOUS (Canine Typhus, Stuttgart Disease).

Subcutaneously.—Canine Distemper Mixed Bacterin (p. 16).

Hypodermoclysis.—Normal solution of Sodium Chloride C.T. (p. 86).

Gastro-intestinal lavage.—Hydrogen Peroxide Sol. (p. 110), diluted.

Orally.—Chloretone (p. 59). Aspirin C.T. (p. 82). Aspirin Compound with Dover Powder (Modified) C.T. (p. 82).

GLANDERS.

Diagnosis.—Mallein (p. 35).

GLANDS, SWOLLEN.

Orally.—Echinacea F.E. (p. 65). Cascarin Comp. Condition Powder (p. 57).

Topically.—Thermofuge (p. 117).

GLAUCOMA.

Instil solution of Pilocarpine Hydrochloride H.T. (p. 97) or 'Codrenine' (p. 125).

'*Oculets.*'—Adrenalin (p. 44), Ethylmorphine Hydrochloride (p. 78), Physostigmine (p. 78), Pilocarpine and Cocaine (p. 79).

GOITRE.

Thyroid Glands, Desiccated (p. 41) is given in goitre of dogs.

GREASE.

Thermofuge (p. 117). Irrigate with solution of Potassium Permanganate C.T. (p. 86), diluted Fecto (p. 108) or Hydrogen Peroxide Sol. (p. 110). Apply Emollientine (p. 105) or compresses of solution of Lead Subacetate C.T. (p. 85).

Orally.—Cascarin Comp. Condition Powder (p. 57).

HÆMATEMESIS.

Orally.—Adrenalin Chloride Sol. (p. 44), Hamamelis L.E. (p. 65).

Subcutaneously.—Hemoplastin (p. 14), Ergot Aseptic (p. 62).

HÆMATURIA.

Vesical injections.—Hamamelis L.E. (p. 65).

Orally.—Ergot Normal Liquid (p. 73), Belladonna L.E. (p. 64), Adrenalin Chloride Sol. (p. 44).

Subcutaneously.—Ergot Aseptic (p. 62), Atropine H.T. (p. 94).

HÆMOGLOBINURIA (Azoturia).

Adrenalin Chloride Sol. (p. 44), orally or subcutaneously.

Subcutaneously.—Arecoline Hydrobromide V.H.T. (p. 93), Physostigmine Salicylate V.H.T. (p. 96). Mixed Infection Phylacogen, Equine (p. 31).

Orally.—Saw Palmetto and Santal Elix. (p. 81), Bromide and Chloral Comp. Elix. (p. 54), Quinine C.T. (p. 86).

If heart is weak.—Nux Vomica L.E. (p. 66), orally; Strychnine V.H.T. (p. 98) or Camphor in Oil (p. 90) subcutaneously.

Hæmoglobinuria of Cattle, see "Piroplasmosis."

HÆMOPTYSIS.

Subcutaneously.—Hemoplastin (p. 14), Pituitrin (p. 51), Adrenalin Chloride Sol. (p. 44), Ergot Aseptic (p. 62).

Orally.—Digitalis, Normal Liquid (p. 73).

HÆMORRHAGE.

Subcutaneously.—Hemoplastin (p. 14), Pituitrin (p. 51), Ergot Aseptic (p. 62).

Topically.—Adrenalin Chloride Sol. (p. 44), Hemoplastin (p. 14), Benzoin Comp. Liq. (p. 64), Hamamelis L.E. (p. 65).

In rectal hæmorrhage in small animals, Adrenalin Suppos. (p. 53).

HÆMORRHAGE, POST-PARTUM.

Subcutaneously.—Pituitrin (p. 51), Ergot Aseptic (p. 62), Hemoplastin (p. 14), Adrenalin Chloride Sol. (p. 44). In small animals, Adrenalin Suppos. (p. 54).

HÆMORRHAGIC SEPTICÆMIA.

Prophylaxis.—Hæmorrhagic Septicæmia Bacterin (p. 28) and ten days later (if feasible) Hæmorrhagic Septicæmia Vaccine (p. 30).

Treatment. — Hæmorrhagic Septicæmia Bacterin (p. 28), Sodium Cacodylate Sol. (p. 92).

HÆMORRHOIDS.

Adrenalin Suppos. (p. 53), Adrenalin and Chloretone Oint. (p. 101), Hamamelin Comp. Suppos. (p. 68), Chloretone Comp. Oint. (p. 104), ointment of wool fat and Hamamelis L.E. (p. 65). Swab with 'Codrenine' (p. 125) or with solution of Lead Subacetate C.T. (p. 85).

Heaves, see " Emphysema."

Hog Cholera, see " Swine Fever."

HYPERÆMIA.

Adrenalin Chloride Sol. (p. 44).

Impaction of Bowel, see " Colic."

IMPOTENCE.

Orally.—Nux Vomica L.E. (p. 66), Saw Palmetto F.E. (p. 67), Saw Palmetto and Santal Elix. (p. 81), Damiana F.E. (p. 65). Damiana, Nux Vomica, Iron and Phosphorus Elix. (p. 61), Phosphorus, Nux Vomica and Damiana Pill (p. 80).

Hypodermically.—Strychnine Sulphate Sol. (p. 92).

INDIGESTION.

Taka-Diastase (p. 88), Pepsin, Bismuth and Charcoal C.T. (p. 85), Bismuth and Soda C.T. (p. 82). Metagen (p. 69).

In gastric fermentative indigestion of dogs, Euthymol (p. 107) or Hydrogen Peroxide Sol. (p. 110).

Also see " Colic."

INFLUENZA.

Prophylaxis. — Anti-Influenza Serum (Equine) (p. 6), preferably in conjunction with Streptococcus-Staphylococcus Bacterin Equine (p. 21).

Treatment.—Anti-Influenza Serum, Equine (p. 6). Streptococcus-Staphylococcus Bacterin (p. 21), Antistreptococcic Serum, Equine (p. 7), Pneumonia Phylacogen, Equine (p. 34). Nuclein (p. 74) may be given with advantage concurrently with any of the foregoing.

Antipyretics.—Aconite F.E. (p. 63), Aconitine H.T. (p. 93).

Respiratory stimulants and demulcents.—Atropine Sulphate H.T. (p. 94), Equine Cough Syrup (p. 62), Cod-Liver Oil Emuls. (p. 61).

To support the heart.—Pituitrin (p. 51).

To counteract local congestion.—Capsolin (p. 103) or Thermofuge (p. 117).

INSECT BITES.

Storaxol (p. 116), solution of Potassium Permanganate C.T. (p. 86).

IRITIS.

Instillation.—Adrenalin Chloride Sol. (p. 44), solution of Protosil (p. 115) or of Neo-Protosil (p. 114).

'Oculets.'—Adrenalin (p. 78), Physostigmine (p. 78), Ethylmorphine (p. 78), Atropine (p. 78).

Orally.—Aspirin C.T. (p. 82), Aspirin Compound with Dover Powder (Modified) C.T. (p. 82). Cannabis Indica, Normal Liquid (p. 73) for pain.

JAUNDICE, CATARRHAL.

Colon Bacterin (p. 19).

JAUNDICE, MALIGNANT.

Subcutaneously.—Solution of Trypan Blue C.T. (p. 87).

Joint Evil, see " Umbilical Infection."

KERATITIS.

Instillation.—Adrenalin Chloride Sol. (p. 44), solution of Protosil (p. 115) or of Neo-Protosil (p. 114).

Antistreptococcic Serum, Equine (p. 7).

Neo-Protosil Ointment (p. 115).

'Oculets.'—Adrenalin (p. 78), Ethylmorphine (p. 78), Physostigmine (p. 78).

LAMINITIS.

The injection of 'Codrenine' (p. 125) or Apothesine Solution (p. 121) along the course of the plantar nerves allows the animal to go sound if the case is merely one of foot lameness, and will assist recovery by permitting exercise.

Treatment.—Adrenalin Chloride Sol. (p. 44), Arecoline Hydrobromide V.H.T. (p. 93), Pilocarpine Hydrochloride V.H.T. (p. 97), all subcutaneously. Mixed Infection Phylacogen, Equine (p. 31) may be helpful. Thermofuge poultices (p. 117). For fever, Aconite F.E. (p. 63) orally; Aconitine V.H.T. (p. 93) subcutaneously.

LARYNGISMUS STRIDULUS.

Throat sprays.—Solution of Mercuric Iodide C.T. (p. 112) by means of the 'Glaseptic' Spray (p. 113), or Chloretone Inhalant (p. 103) by means of 'Glaseptic Nebuliser (p. 113).

Subcutaneously. — Apomorphine Hydrochloride H.T. (p. 93).

Externally.—Thermofuge (p. 117) or Capsolin (p. 103).

LARYNGITIS.

Throat sprays.—Hydrogen Peroxide Sol. (p. 110), diluted, Chloretone Inhalant (p. 103), Adrenalin Chloride Sol. (p. 44), solution of Neo-Protosil (p. 114), or Mercuric Iodide C.T. (p. 112).

Subcutaneously.—Anti-Influenza Serum (p. 6), Streptococcus-Staphylococcus Bacterin, Equine (p. 21). Atropine Sulphate H.T. (p. 94), Morphine H.T. (p. 96).

Orally.—Equine Cough Syr. (p. 62), Liquorice F.E. (p. 66), Ipecacuanha L.E. (p. 66), Chlor-Anodyne, Vet. (p. 58).

Externally.—Thermofuge (p. 117) or Capsolin (p. 103).

LYMPHANGITIS.

Subcutaneously.—Nuclein (p. 74), alternated with Streptococcus-Staphylococcus Bacterin, Equine (p. 21). Aconitine H.T. (p. 93).

Orally.—Adrenalin Chloride Sol. (p. 44), solution of Mercuric Iodide C.T. (p. 112).

MALLENDERS.

Poultice of Thermofuge (p. 117) overnight. Next morning, remove scales with warm water and Germicidal Soap (p. 109), dry and apply Storaxol (p. 116).

Also see " Eczema."

MALNUTRITION.

Cod-Liver Oil Emuls. (p. 61), Hematic Hypophosphites (p. 68), Nucleo-Proteid Comp. C.C.T. (p. 85), Metagen (p. 69), Metagen and Cod-Liver Oil Emulsion (p. 71).

Taka-Diastase and Pepsin Comp. C.T. (p. 88) are of great value for promoting assimilation of nutriment.

MAMMITIS (Garget).

Subcutaneously.—Mixed Infection Bacterin, Bovine (p. 20). Nuclein (p. 74) alternated with Streptococcus-Staphylococcus Bacterin, Equine (p. 21). Aconitine V.H.T. (p. 93).

Injections into udder.—Hydrogen Peroxide Sol. (p. 110), solution of Dibromin (p. 104).

Topically.—A poultice of Thermofuge (p. 117) combined with Phytolacca F.E. (p. 66) and Belladonna F.E. (p. 64), supported by suspensory bandage.

Orally.—Saline purge. Phytolacca F.E. (p. 66) with Belladonna F.E. (p. 64).

MANGE (Scabies).

For the horse, Streptococcus-Staphylococcus Bacterin, Equine (p. 21), and for the dog, Staphylococcus-Streptococcus Bacterin, Canine (p. 20), alternated with Nuclein (p. 74) subcutaneously, and aided by the use of local antiseptics and parasiticides, *e.g.*, Etherea Antiseptic Soap (p. 106), Germicidal Soap (p. 109), solution of Mercuric Iodide C.T. (p. 112), Storaxol (p. 116), Chloretone Comp. Oint. (p. 104). Lotion of Stavesacre Seed F.E. (p. 67), diluted.

Orally.—Mercuric Iodide C.T. (p. 112). Cascarin Comp. Condition Powder (p. 57).

MENINGITIS.

Orally.—Bromide and Chloral Comp. Elix. (p. 54), Chloretone and Belladonna Comp. Caps. (p. 54).

Subcutaneously.—Physostigmine V.H.T (p. 97), Pilocarpine H.T. (p. 97).

METRITIS.

Subcutaneously.—Mixed Infection Bacterin, Bovine (p. 20). Nuclein (p. 74) in conjunction with Streptococcus-Staphylococcus Bacterin (p. 21), Mixed Infection Phylacogen, Equine (p. 31) or Antistreptococcic Serum, Equine (p. 7).

Intra-uterine injections.—Solution of Mercuric Iodide C.T. (p. 112) or of Protosil (p. 115). Hydrogen Peroxide Sol. (p. 110), Hydrastis L.E. (p. 65), diluted. Tampon of Thiodine (p. 118), solution of Chloretone (p. 59) or solution of Dibromin (p. 104). In small animals, Thiodine Vaginal Suppos. (p. 118).

Milk Fever, see " Paralysis, Parturient."

Mud Fever, see " Fissure."

Navel-Ill, see " Umbilical Infection."

NEPHRITIS.

Subcutaneously.—Pilocarpine Hydrochloride V.H.T. (p. 97).

Orally.—Saw Palmetto F.E. (p. 67), Saw Palmetto and Santal Elix. (p. 81), Buchu Liq. (p. 64).

Externally.—Thermofuge (p. 117).

Also see " Hæmaturia."

NEURALGIA.

Orally.—Aspirin C.T. (p. 82), Hematic Hypophosphites (p. 68).

Subcutaneously.—Morphine Sulphate V.H.T. (p. 96).

Externally.—Adrenalin and Chloretone Oint. (p. 101) over the course of the nerve Capsolin (p. 103).

OBESITY.

Thyroid Gland, Desiccated (p. 41) is given in some forms of canine obesity.

ŒDEMA.

Orally.—Mercuric Iodide C.T. (p. 112).

Topically.—Solution of Lead and Opium C.T. (p. 85).

OPERATIONS.

If the subject has a hæmophiliac tendency, the injection of Hemoplastin (p. 14) is indicated.

If conditions render infection possible, prophylactic injections of Antistreptococcic Serum, Equine (p. 7) or Antitetanus Serum, Vet. (p. 9) will be a wise precaution.

To sterilise hands, instruments and the site of injection.—Ethereal Antiseptic Soap (p. 106), Germicidal Soap (p. 109), solution of Mercuric Iodide C.T. (p. 112).

Sedatives prior to operations.—Injections of Scopolamine and Morphine H.T. (p. 97), or Morphine and Strychnine H.T. (p. 96), also Cannabis Indica, Normal Liquid (p. 73) or Chloretone (p. 59), orally, are useful for obviating restiveness either when taking an anæsthetic or under local anæsthesia, as well as for reducing post-operative pain or pain caused by changing dressings.

Local anæsthetics.—Apothesine (p. 121), 'Codrenine' (p. 125), or Quinine and Urea (p. 127) will give satisfactory analgesia for such operations as the removal of tumours, cysts, vaginal polypi, etc., firing, castration, tracheotomy, amputations, docking, neurectomy, tenotomy, enucleation of eyeball, removal of foreign body in eye, etc.

To deodorise hands after operations.—Ethereal Antiseptic Soap (p. 106). Diluted Fecto (p. 108).

OPHTHALMIA.

Instillations.—Adrenalin Chloride Sol. (p. 44). Protosil (p. 115), Zinc Sulphate C.T. (p. 87), Mercuric Iodide C.T. (p. 112), or Lead Subacetate C.T. (p. 85). 'Codrenine' (p. 125), Yellow Oxide of Mercury Oint. (p. 118), Neo-Protosil Ointment (p. 115).

'*Oculets.*'—Adrenalin (p. 78), Atropine (p. 78), Cocaine (p. 78), Ethylmorphine (p. 78), Physostigmine (p. 78), Zinc Sulphate (p. 79).

In suppurative forms. — Streptococcus-Staphylococcus Bacterin (p. 21).

OSTEITIS.

Blistering Oint. (p. 102).

OTITIS.

Instillations.—Hydrogen Peroxide Sol. (p. 110). Solution of Protosil (p. 115) or Neo-Protosil (p. 114) or Dibromin (p. 104). Adrenalin Oint. (p. 101) or Adrenalin and Chloretone Oint. (p. 101).

Subcutaneously.—Mixed Infection Phylacogen, Equine (p. 31).

Over-Reach, see "Wounds."

PARALYSIS.

Treat the underlying cause—worms, constipation, nephritis, debility, etc.

Subcutaneously. — Strychnine Sulphate H.T. (p. 98) or Sol. (p. 92).

Orally.—Hyoscyamus F.E. (p. 65).

Topically.—Blistering Oint., Vet. (p. 102), Capsolin (p. 103).

PARALYSIS, PARTURIENT (Milk Fever).

Subcutaneously.—Adrenalin Chloride Sol. (p. 44).

Intra-uterine injection.—Hydrogen Peroxide Sol. (p. 110).

Externally.—Apply Thermofuge (p. 117) over loins.

Treat Mammitis as indicated under that heading.

PARASITES, EXTERNAL.

Bots.—Germicidal Soap, Soft (p. 109).

Fleas on dogs, cats, etc.—Quassia F.E. (p. 67), shampoo with Ethol (p. 107).

Lice.—Ethereal Antiseptic Soap (p. 106), Germicidal Soap (p. 109), dilutions of Quassia F.E. (p. 67) or Stavesacre F.E. (p. 67).

Pig Maggots.—Germicidal Soap, Soft (p. 109).

Scab or Ticks.—Ethereal Antiseptic Soap (p. 106), Germicidal Soap, Soft (p. 109), solution of Mercuric Iodide C.T. (p. 112) or Antiseptic C.T. (p. 101), Storaxol (p. 116).

Parasites, Internal, see "Worms."

PARESIS, INTESTINAL.

Subcutaneously.—Pituitrin (p. 51), Physostigmine V.H.T. (p. 97), Arecoline Hydrobromide V.H.T. (p. 93).

PAROTITIS.

Orally.—Aconite F.E. (p. 63).

Topically.—Thermofuge (p. 117).

Pasteurellosis, see "Hæmorrhagic Septicæmia."

PERIOSTITIS.

Topically.—Blistering Oint. (p. 102), Capsolin (p. 103), Thermofuge (p. 117), compress of solution of Lead and Opium C.T. (p. 85).

Orally.—Chlor-Anodyne, Vet. (p. 58) to relieve pain.

PERITONITIS.

Colon Bacterin (p. 19).

Subcutaneously.—Aconitine H.T. (p. 93), Morphine Sulphate H.T. (p. 96).

Orally.—Chlor-Anodyne, Vet. (p. 58), Belladonna F.E. (p. 64).

Externally.—Blistering Oint. (p. 102), Capsolin (p. 103). Thermofuge (p. 117).

To support the heart.—Adrenalin Chloride Sol. (p. 44) or Camphor in Oil (p. 90), subcutaneously.

PHARYNGITIS.

Throat sprays.—Chloretone Inhalant (p. 103), by means of the 'Glaseptic' Nebuliser (p. 113). Solution of Protosil (p. 115) or solution of Neo-Protosil (p. 114), Euthymol (p. 107) by means of the 'Glaseptic' Spray (p. 114).

Orally.—Chlor-Anodyne, Vet. (p. 58), Equine Cough Syr. (p. 62), Cocillana Comp. Syr. (p. 60), Liquorice F.E. (p. 66), Aconite F.E. (p. 63), Belladonna F.E. (p. 64).

Subcutaneously.—Adrenalin Chlor. Sol. (p. 44), Aconitine H.T. (p. 93), Atropine H.T. (p. 94).

Externally.—Capsolin (p. 103) or Thermofuge (p. 117).

PICA.

Apomorphine Hydrochloride H.T. (p. 93).

Pink Eye, see "Influenza."

PIROPLASMOSIS (Texas Fever, Hæmoglobinuria of Cattle, Red Water).

Subcutaneously.—Solution of Trypan Blue C.T. (p. 87), Sodium Cacodylate Sol. (p. 91), Camphor in Oil (p. 90).

Hypodermoclysis.—Physiological solution of Sodium Chloride C.T. (p. 86).

PLACENTA, RETENTION OF.

Prophylactic.—Mixed Infection Bacterin, Bovine (p. 20).

Subcutaneously.—Ergot Aseptic (p. 62).

Orally.—Ergot, Normal Liquid (p. 73) with Mugwort F.E. (p. 66).

Uterine douche.—Solution of Mercuric Iodide C.T. (p. 112) or of Germicidal Soap (p. 109) to prevent sepsis.

PLEURISY.

Subcutaneously.—Nuclein (p. 74), Aconitine H.T. (p. 93).

Orally.—For cardiac irregularity: Digitalis, Normal Liquid (p. 73).

Externally.—Capsolin (p. 103), Flavolin (p. 109), Thermofuge, Vet. (p. 117).

In effusion, after paracentesis, inject Adrenalin Chloride Sol. (p. 44) to prevent re-accumulation.

PLEURO-PNEUMONIA, EPIZOOTIC.

Subcutaneously.—Nuclein (p. 74), alternated with Pneumonia Phylacogen, Equine (p. 34), Antistreptococcic Serum, Equine (p. 7).

Also see "Hæmorrhagic Septicæmia."

Pneumo-Enteritis, see "Hæmorrhagic Septicæmia."

PNEUMONIA.

Subcutaneously.—Nuclein (p. 74) alternated with Pneumonia Phylacogen, Equine (p. 34). Streptococcus-Staphylococcus Bacterin, Equine (p. 21), Antistreptococcic Serum, Equine (p. 7), Anti-Influenza Serum, Equine (p. 6), Sodium Cacodylate Sol. (p. 91). For pyrexia: Aconitine H.T. (p. 93). For cardiac weakness: Adrenalin Chloride Sol. (p. 44), Camphor in Oil (p. 90), Digitalin (p. 95).

Intravenously.—Hydrogen Peroxide Sol. (p. 110).

Orally.—Aconite F.E. (p. 63). Digitalis, Normal Liquid (p. 73) for heart symptoms.

Mouth and throat spray.—Hydrogen Peroxide Sol. (p. 110) or 'Euthymol' (p. 107) by 'Glaseptic' Spray (p. 113).

Externally.—Capsolin (p. 103), Flavolin (p. 109), Thermofuge, Vet. (p. 117).

For cough.—Cocillana Comp. Syr. (p. 60).

In convalescence.—Cod-Liver Oil Emuls. (p. 61), Hematic Hypophosphites (p. 68). Triple Glycerophosphates C.C.T. (p. 87), Pituitrin (p. 51).

POLL-EVIL.

Subcutaneously.—Nuclein (p. 74) alternated with Streptococcus-Staphylococcus Bacterin, Equine (p. 21), Antistreptococcic Serum, Equine (p. 7) or Mixed Infection Phylacogen, Equine (p. 31).

Surgical treatment under analgesia with Apothesine (p. 121), Quinine and Urea (p. 127) or 'Codrenine' (p. 125).

Irrigation.—Solution of Germicidal Soap (p. 109) or Mercuric Iodide C.T. (p. 112); Hydrogen Peroxide Sol. (p. 110), diluted Fecto (p. 108), or solution of Dibromin (p. 104).

Dressings.—Emollientine (p. 105), Boroseptic Oint. (p. 102).

Orally.—Echinacea F.E. (p. 65), Mercuric Iodide C.T. (p. 112), Cascarin Comp. Condition Powder (p. 57).

POLYURIA.

Orally.—Hydrastis L.E. (p. 65), Belladonna L.E. (p. 64).

Treat Cystitis, if present, as indicated under that head.

PROCIDENTIA UTERI.

Submucous injection of Adrenalin Chloride Sol. (p. 44) to permit replacement.

PROLAPSUS RECTI.

Submucous injection of Adrenalin Chloride Sol. (p. 44) before replacement.

PRURIGO.

Topically.—Ethereal Antiseptic Soap (p. 106), Germicidal Soap (p. 109), Storaxol (p. 116).

Orally.—Mercuric Iodide C.T. (p. 112), Cascarin Comp. Condition Powder (p. 57).

PRURITUS.

Most of the preparations indicated in the previous section will be of use in pruritus, also the following:—

Topically.—Solution of Mercuric Iodide C.T. (p. 112) or Lead and Opium C.T. (p. 85). Boroseptic Oint. (p. 102), Adrenalin and Chloretone Oint. (p. 101), Chloretone Comp. Oint. (p. 104), Storaxol (p. 116).

Orally.—Hematic Hypophosphites (p. 68), Iron and Arsenic T.T. (p. 84). Cascarin Comp. Condition Powder (p. 57).

PTYALISM.

Sprays for the mouth.—Solution of Zinc Sulphate C.T. (p. 87) by the 'Glaseptic' Spray (p. 113).

Belladonna F.E. (p. 64), orally, or Atropine H.T. (p. 94), subcutaneously.

PURPURA HÆMORRHAGICA.

Subcutaneously.—Nuclein (p. 74) alternated with Streptococcus-Staphylococcus Bacterin, Equine (p. 21), Anti-Influenza Serum, Equine (p. 6), Antistreptococcic Serum, Equine (p. 7) or Mixed Infection Phylacogen, Equine (p. 31). Adrenalin Chloride Sol. (p. 44), Hemoplastin (p. 14). For cardiac irregularity: Digitalin V.H.T. (p. 95).

Orally.—Echinacea F.E. (p. 65), Mercuric Iodide C.T. (p. 112), Saw Palmetto and Santal Comp. Elixir (p. 81).

PYÆMIA.

Subcutaneously.—Nuclein (p. 74) alternated with Streptococcus-Staphylococcus Bacterin (p. 21), Mixed Infection Phylacogen, Equine (p. 31) or Antistreptococcic Serum, Equine (p. 7). To support the heart: Camphor in Oil (p. 90).

Orally.—Salol C.T. (p. 86), Echinacea F.E. (p. 65).

Pyæmic Arthritis, see "Umbilical Infection."

Pyrexia, see "Febrile Disorders."

Quarter-Evil, see "Blackleg."

QUITTOR.

Apply Thermofuge, Vet. (p. 117) to soften horn, and subsequently remove necrosed tissue under analgesia with Apothesine (p. 121), Quinine and Urea (p. 127) or 'Codrenine' (p. 125).

Irrigation with solution of Mercuric Iodide C.T. (p. 112) or diluted Fecto (p. 108) or Dibromin solution (p. 104).

Subcutaneously.—Antistreptococcic Serum, Equine (p. 7), Streptococcus-Staphylococcus Bacterin, Equine (p. 21), Mixed Infection Phylacogen, Equine (p. 31).

Red Water, see "Piroplasmosis."

RETINA, DETACHMENT OF.

Instil solution of Pilocarpine Hydrochloride V.H.T. (p. 97) or Pilocarpine and Cocaine 'Oculet' (p. 79).

Rheumatism, Articular, see "Arthritis."

RHEUMATISM, MUSCULAR.

Topically.—Capsolin (p. 103), Flavolin p. 109), Thermofuge, Vet. (p. 117). Aconite F.E. (p. 63) with an equal volume of soap liniment.

Orally.—Aspirin C.T. (p. 82), Aspirin Compound with Dover Powder (Modified) C.T. (p. 82).

Subcutaneously.—Camphor in Oil (p. 90).

RICKETS.

Cod-Liver Oil Emuls. (p. 61). Hematic Hypophosphites (p. 68). Metagen (p. 69). Metagen and Cod-Liver Oil Emulsion (p. 71).

RINGBONE.

Blistering Oint., Vet. (p. 102).

RINGWORM.

Applications.—Germicidal Soap, Soft (p. 109). Solution of Mercuric Iodide C.T. (p. 112) or Antiseptic C.T. (p. 101). Storaxol (p. 116).

ROUP IN POULTRY.

Spray throat and nostrils with Chloretone Inhalant (p. 103) by means of the 'Glaseptic' Nebuliser (p. 113), or with diluted Hydrogen Peroxide Sol. (p. 110) by means of the 'Glaseptic' Spray (p. 113).

Instil into eyes.—Solution of Neo-Protosil (p. 114).

Saddle Galls, see "Wounds."

Scabies, see "Mange."

Scalds, see "Burns and Scalds."

Scouring, see "Diarrhœa," also "White Scour."

Septicæmia, see "Pyæmia," also "Hæmorrhagic Septicæmia."

Shipping Fever, see "Influenza."

SHOCK AND COLLAPSE.

Subcutaneously or Intravenously.—Adrenalin Chloride Sol. (p. 44), Pituitrin (p. 51).

Subcutaneously.—Camphor in Oil (p. 90), Digitalin and Strychnine H.T. (p. 95).

SIDE BONE.

Blistering Oint., Vet. (p. 102).

SINUSES.

Open up under analgesia from Apothesine (p. 121), Quinine and Urea (p. 127) or 'Codrenine' (p. 125).

Irrigate with solution of Protosil (p. 115) or solution of Dibromin (p. 104), Hydrogen Peroxide Sol. (p. 110), diluted Fecto (p. 108), solution of Neo-Protosil (p. 114).

Subcutaneously.—Nuclein (p. 74) concurrently with Mixed Infection Phylacogen, Equine (p. 31).

SITFASTS.

Thermofuge (p. 117). Remove surgically and treat as for "Wounds."

SNUFFLES.

In Rabbits.—Hutches must be disinfected with Fecto (p. 108) and the attendant's hands with Germicidal Soap (p. 109).

In Pigs.—Nasal spray of 5% solution of Protosil (p. 115), solution of Neo-Protosil (p. 114) or diluted Hydrogen Peroxide Sol. (p. 110), by means of the 'Glaseptic' Spray (p. 113).

Sore Throat, see "Pharyngitis."

Sores, see "Wounds."

SPAVIN, BONE.

Blistering Oint., Vet. (p. 102), Capsolin (p. 103), Thermofuge (p. 117). Apothesine in firing (p. 121).

SPLINT.

Blistering Oint., Vet. (p. 102), Capsolin (p. 103). For firing, Apothesine (p. 121).

SPRAINS.

Blistering Oint., Vet. (p. 102), Capsolin (p. 103). Flavolin (p. 109). Thermofuge (p. 117), compress of solution of Lead and Opium C.T. (p. 85).

Sterility, see "Impotence."

STOMATITIS.

Spray mouth and throat with Hydrogen Peroxide Sol. (p. 110), solution of Protosil (p. 115) or Neo-Protosil (p. 114).

Orally.—Echinacea F.E. (p. 65).

STRAINING, POST-PARTUM.

Submucous injection of Adrenalin Chloride Sol. (p. 44).

STRANGLES.

Prophylaxis.—Anti-Influenza Serum, Equine (p. 6) or Antistreptococcic Serum, Equine (p. 7), followed by a course of Streptococcus - Staphylococcus Bacterin, Equine (p. 21).

Treatment. — Antistreptococcic Serum, Equine (p. 7) or Mixed Infection Phylacogen, Equine (p. 31) concurrently with Streptococcus-Staphylococcus Bacterin (p. 21). Nuclein (p. 74). Sodium Cacodylate Sol. (p. 91). Apply Thermofuge (p. 117) or Capsolin (p. 103) locally. Incise abscesses under analgesia from Apothesine (p. 121), Quinine and Urea (p. 127) or 'Codrenine' (p. 125), irrigate with solution of Mercuric Iodide C.T. (p. 112) or Antiseptic C.T. (p. 101), diluted Fecto (p. 108), or Hydrogen Peroxide Sol. (p. 110), and apply antiseptic dressings, *e.g.*, Boroseptic Oint. (p. 102) or Emollientine (p. 105).

Orally.—Echinacea F.E. (p. 65), Mercuric Iodide C.T. (p. 112), Cascarin Comp. Condition Powder (p. 57).

Strongylosis, see "Hoose."

Stuttgart Disease, see "Gastro-enteritis, Contagious."

SWINE FEVER.

Subcutaneously.—Mixed Infection Phylacogen, Equine (p. 31).

Disinfect styes with dilution of Fecto (p. 108).

SYNOVITIS.

Topically.—Capsolin (p. 103), Thermofuge (p. 117), Blistering Oint., Vet. (p. 102), Flavolin (p. 109).

Orally.—Cascarin Comp. Condition Powder (p. 57).

Subcutaneously or orally.—Nuclein (p. 74).

Tapeworm, see "Worms."

TETANUS.

Prophylaxis.—Inject Antitetanus Serum, Vet. (p. 9). Irrigate the wound with Hydrogen Peroxide Sol. (p. 110).

Treatment.—Continue the prophylactic measures, and give a rectal injection of Chloretone (p. 59) in warm olive oil to allay trismus [Cannabis Indica, Normal Liquid (p. 73) or Bromide and Chloral Comp. Elix. (p. 55) may be given orally for the same purpose].

Texas Fever, see "Piroplasmosis."

Thoracic Choke, see "Choking."

Thrush, see "Stomatitis."

THRUSH IN HORSE'S FROG.

Poultice with Thermofuge (p. 117). Irrigate with solution of Mercuric Iodide C.T. (p. 112), Hydrogen Peroxide Sol. (p. 110) or diluted Fecto (p. 108). Dust with Camphalum (p. 102). Apply Germicidal Soap, Soft (p. 109), Emollientine (p. 105), Storaxol (p. 116).

TUBERCULOSIS.

Diagnosis.—Tuberculin (pp. 36–40).

Treatment, if entered upon, includes the subcutaneous injection of Nuclein (p. 74), or of Camphor in Oil (p. 90) and the oral administration of Hematic Hypophosphites (p. 68), or Triple Glycerophosphates C.C.T. (p. 87).

Treat hæmoptysis as indicated under that heading. Secondary infections may be treated with Streptococcus-Staphylococcus Bacterin (p. 21).

Tympanites, see "Colic."

Typhus, Canine, see "Gastro-enteritis, Contagious."

ULCERS.

Subcutaneously.—Nuclein (p. 74).

Topically.—Solution of Protosil (p. 115), solution of Neo-Protosil (p. 114) or of Dibromin (p. 104) or Zinc Sulphate C.T. (p. 87); diluted Fecto (p. 108) or Emollientine (p. 105), Germicidal Soap, Soft (p. 109), Storaxol (p. 116), Chloretone Comp. Oint. (p. 104), Scarlet Red Oint. (p. 116).

Orally.—Cascarin Comp. Condition Powder (p. 57).

ULCERS, CORNEAL.

Instillations.—Diluted Hydrogen Peroxide Sol. (p. 110), Neo-Protosil Ointment (p. 115).

'*Oculets*'—Ethylmorphine (p. 78), Physostigmine (p. 78).

UMBILICAL HERNIA.

Blistering Oint., Vet. (p. 102).

UMBILICAL INFECTION (Pyæmic arthritis, Joint-evil, Navel-ill).

Precautionary measures.—Inject Antistreptococcic Serum, Equine (p. 7) within from twenty-four to forty-eight hours after birth, and also seven days later.

It is a valuable pre-natal precaution to give in-foal mares a course of Streptococcus-

Staphylococcus Bacterin (p. 21) a few months before foaling, also 15 c.c. of Antistreptococcic Serum (p. 7) on the tenth and third days before the expected date of foaling.

Treatment. — Antistreptococcic Serum, Equine (p. 7). Subcutaneous injection of Nuclein (p. 74) alternated with Streptococcus-Staphylococcus Bacterin (p. 21), Mixed Infection Phylacogen, Equine (p. 31). The oral administration of Echinacea F.E. (p. 65) with Saw Palmetto and Santal Elix. (p. 81) has also been favourably mentioned.

Dress the navel with solution of Neo-Protosil (p. 114) or solution of Dibromin (p. 104).

URETHRITIS.

Subcutaneously.—Colon Bacterin (p. 19).

Injection.—5% solution of Protosil (p. 115) or of Neo-Protosil (p. 114) or of Dibromin (p. 104).

Orally.—Saw Palmetto F.E. (p. 67), Saw Palmetto and Santal Elix. (p. 81).

UTERINE INERTIA.

Pituitrin (p. 51), subcutaneously.

VAGINITIS.

Douches.—Hydrogen Peroxide Sol. (p. 110), solution of Protosil (p. 115) solution of Neo-Protosil (p. 114), or of Dibromin (p. 104) or Antiseptic C.T. (p. 101), diluted Hydrastis L.E. (p. 65).

Tampon or pigment of Thiodine (p. 118). Adrenalin Oint. (p. 101) or Adrenalin and Chloretone Oint. (p. 101).

In smaller animals: Thiodine Vaginal Suppos. (p. 118).

VESICAL IRRITATION.

Orally.—Liq. Buchu (p. 64), Saw Palmetto F.E. (p. 67), Saw Palmetto and Santal Elix. (p. 81).

Also see "Cystitis."

VOMITING, CANINE.

Orally.—Chloretone (p. 59).

WARBLES IN CATTLE.

Apply Germicidal Soap, Soft (p. 109).

WHITE SCOUR IN CALVES.

Prophylaxis.—Subcutaneous injection of Anti-White-Scour Serum (p. 13).

Treatment.—Continue the Anti-White-Scour Serum; it may be alternated with Nuclein (p. 74) or Mixed Infection Phylacogen, Equine (p. 31). If navel infection is present give Antistreptococcic Serum (p. 7) in addition.

Withers, Fistulous, see "Fistula."

WORMS.

Ascarides.—Chenopodium Oil Caps. (p. 58), Carbon Tetrachloride Caps. (p. 56), Nema (Tetrachlorethylene) Caps. (p. 72), Santonin and Calomel T.T. (p. 86). Rectal injection of diluted Quassia F.E. (p. 67).

Tapeworm.—Male Fern L.E. (p. 69). A dose of Chloretone (p. 59) given before a male-fern draught favours its retention.

Hookworm.—Chenopodium Oil Caps. (p. 58). Carbon Tetrachloride Caps. (p. 56). Nema (Tetrachlorethylene) Caps. (p 72).

WOUNDS.

To quiet animal while wounds are dressed.—Scopolamine and Morphine H.T. (p. 97).

To prevent tetanus infection.—Flush with Hydrogen Peroxide Sol. (p. 110), inject Antitetanus Serum (p. 9) subcutaneously. These measures are particularly necessary in punctured wounds of the feet.

To prevent sepsis.—Inject Streptococcus-Staphylococcus Bacterin, Equine (p. 21). Nuclein also is desirable (p. 74). Apply Chloretone (p. 59) on gauze.

For bleeding.—Adrenalin Chloride Sol. (p. 44) topically or subcutaneously. Hemoplastin (p. 14) subcutaneously.

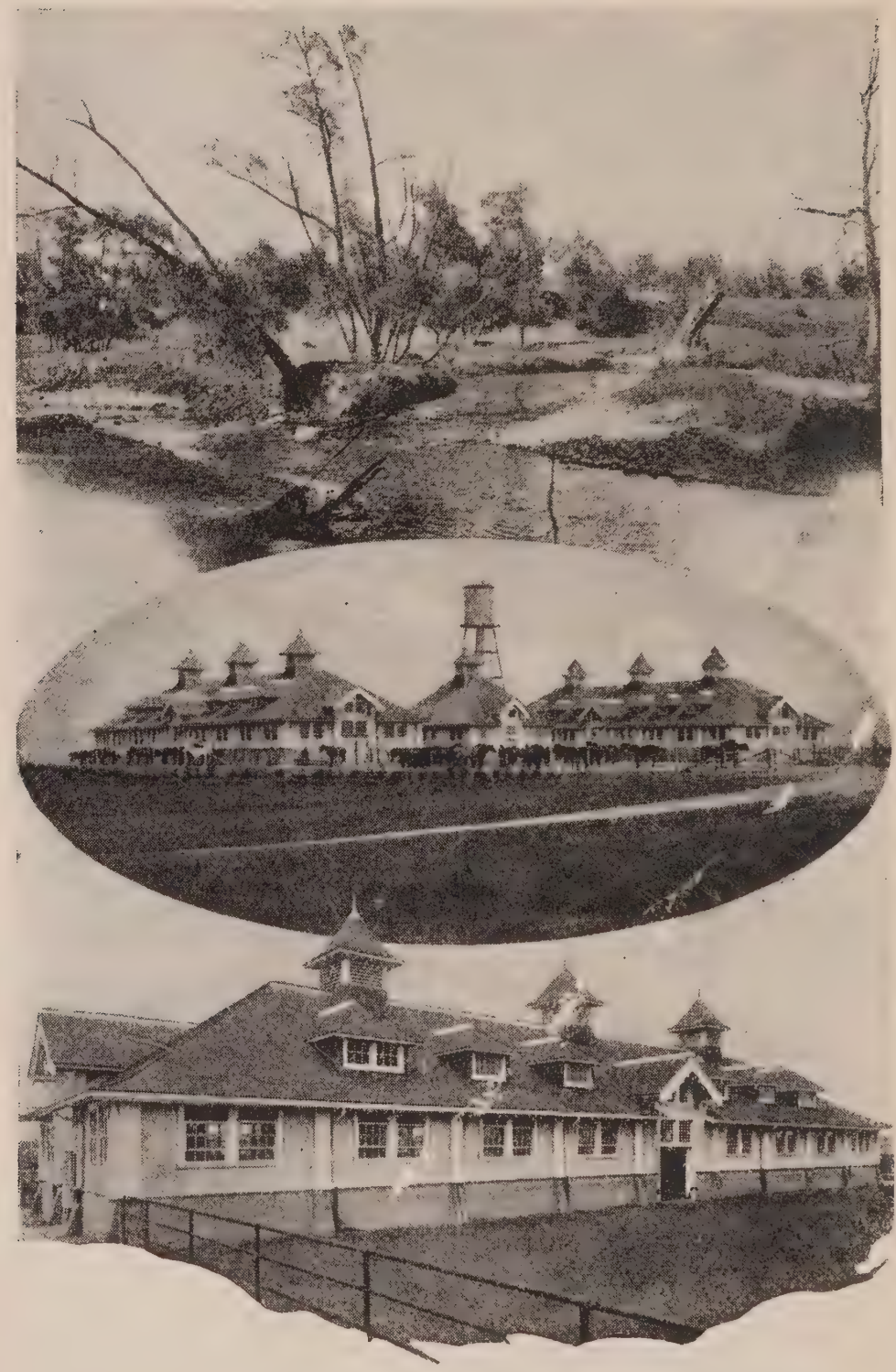
For slight abrasions.—Benzoin Comp. Liq. (p. 64).

Irrigation.—Solution of Mercuric Iodide C.T. (p. 112), Antiseptic C.T. (p. 101) or Dibromin (p. 104). Hydrogen Peroxide Solution (p. 110). Dilution of Fecto (p. 108)

To assist removal of blood-stained dressings.—Saturate with Hydrogen Peroxide Sol. (p. 110).

Indolent wounds.—Inject Nuclein (p. 74) subcutaneously. Dress wound with 5 to 10% solution of Protosil (p. 115) or Neo-Protosil (p. 114), Emollientine (p. 105), Boroseptic Oint. (p. 102), Scarlet Red Oint. (p. 116). Dust with Camphalum (p. 102).

Septic wounds.—To promote discharge, smear surrounding area with Capsolin (p. 103). Give hypodermic injections of Mixed Infection Phylacogen, Equine (p. 31), Antistreptococcic Serum, Equine (p. 7), Streptococcus-Staphylococcus Bacterin (p. 21) or Nuclein (p. 74).



PARKE, DAVIS & COMPANY'S BIOLOGICAL FARM.

1. A PICTURESQUE CORNER. 2. A GROUP OF SERUM HORSES.
3. A MODERN STABLE.

INTRODUCTION.

IT is more than thirty years since Parke, Davis & Co. first undertook the manufacture of biological products, and they can fairly claim that their experience in this direction is unequalled.

In addition to their extensive laboratories at Detroit, Mich., they own a tract of 700 acres of farm land at Parkedale, some thirty miles from Detroit, on the hills and pastures of which, dotted with woods and intersected with streams, there is afforded a natural environment for the horses, calves, rams, goats, and other animals which bear some part or other in the elaboration or testing of biological therapeutic agents.

Some years ago the Government of the United States passed a law imposing very strict conditions under which the production of biological products may only be carried on, and requiring all laboratories for the purpose to be duly inspected and licensed. Parke, Davis & Co.'s Laboratories were subjected to a rigid official inspection, and the firm was granted License No. 1.

Veterinary Serums.

For the production of the various antitoxins and antibacterial serums, horses are inoculated either subcutaneously or intravenously as the case may be, with small doses of toxin or bacterial suspension; these doses being gradually increased on subsequent occasions until the animal has developed the capacity to withstand doses very greatly in excess of that to which the normal animal would succumb.

When, after some months of repeated injections of toxins or suspensions, a horse has developed antibodies so that there is no reaction to an injection, the animal is said to have acquired a condition of hyper-immunity. The horse is then bled from the jugular vein, the blood allowed to flow into sterile glass tubes which are kept for several days in cold storage until the serum separates from the clot. This is poured off into sterile bottles and a suitable preservative is added. Then bacterial tests are made for sterility and safety.

In the case of Tetanus Antitoxin the potency of the serum is estimated by observing the volume of serum required to protect the life of a guinea-pig of standard weight from a lethal dose of tetanus toxin. The serum is then tested for sterility and toxicity before being filled into ampoules for distribution.

As a further safeguard, several of the finished packages are distributed among three bacteriologists for a final test before the serum is issued for the use of the veterinary profession.

Veterinary Bacterins and Vaccines.

It is necessary to point out that in this book a distinction is made between the terms "bacterin" and "vaccine." The usual British practice is to regard vaccines as suspensions of dead micro-organisms, but in order that the descriptions of the various preparations may conform to the titles on the packages, we have adopted for veterinary bacterins and vaccines the definitions now in common use in America. The name "Bacterins" therefore is applied to bacterial vaccines made from dead organisms, and the name "Vaccines" to those products in which the organisms exist in an attenuated but viable state. The chief representatives of the latter class are "Anthraxoids" and "Blacklegoids," which are described under their respective headings (*see pp.* 24 and 25).

Mode of Action.—The use of bacterins (bacterial vaccines) in veterinary medicine is in keeping with nature's own method of curing disease. When pathogenic bacteria invade the animal organism, nature provides the means for their destruction in the action of the phagocytes. But when the invading bacteria are of exceptional virulence, the protective forces of the animal attacked may not be equal to overcoming the infection. In such a case, the subcutaneous injection of a suspension of killed bacteria (*i.e.*, a bacterin) of the same species as the invading organism, stimulates the action of the leucocytes in such a way as to facilitate the destruction of the invading bacteria.

The Effects Produced by an Injection of Bacterin.—A properly-prepared bacterin is perfectly harmless, but it must be used judiciously. The *immediate* effect of its injection is a decrease in the resistance of the animal (*negative phase*), but soon this is followed by a marked increase in resistance (*positive phase*). It is desirable to wait until the negative phase is over, and a noticeable improvement has taken place, before giving another injection. In most instances an interval of three to five days between doses is a suitable period to allow. The negative phase is usually manifested by a slight aggravation of the local symptoms, an increase in temperature and indications of general malaise.

The results obtained by the use of bacterins properly administered are very gratifying. Many stubborn suppurative conditions which do not yield to ordinary surgical and medicinal treatment may be cured by their means; febrile disorders of bacterial origin in many cases respond promptly to this treatment; and wounds which are suspected of infection with pus-producing organisms may be caused to heal in an unusually short space of time (to the great saving of labour, drugs and dressings) by an early injection of the appropriate bacterin, coupled with *cleansing and drainage.*

The Selection of the Bacterin to be Used.—While it is sometimes preferable that a bacterial vaccine or bacterin should be prepared from

organisms obtainable from the animal to be treated, this involves considerable expense and the lapse of time, and very excellent results often follow the use of stock vaccines prepared from multiple strains of the bacteria to which the disease is due. Indeed, it may be urged that in cases in which an autogenous vaccine is being prepared, treatment with a stock vaccine should be commenced until such time as the other is ready.

For the successful use of a stock bacterin, an accurate knowledge of the infecting organism or organisms is imperative, in order that a remedy shall be employed which has been prepared from organisms of the same species. Where this identification is not secured, the use of a stock bacterin must always be empirical.

Diseases which present very different clinical features may yet be due to the same organism and, consequently, require treatment with the same bacterin, though local measures will have to be adapted to the needs of the several conditions.

Considerations as to Dosage.—It is impossible to lay down precise rules as to the dosage of a bacterin ; the amount to be given must be decided in every case by the condition of the animal, and the reaction which follows the initial dose. It should be stated, however, that when given for the cure of an infection, the dose of a bacterin should always be less than when given for prophylactic purposes to an uninfected animal. In the former case it is desired to give a dose which will just suffice to stimulate the formation of antibodies without introducing more than can be avoided of the endotoxins which are present in the bacterin, and it is better to give a little less than sufficient, rather than a little more. If the animal reacts moderately, shows a slight rise in temperature and at first appears somewhat worse but in the course of a day or two improves considerably, the dose was correctly apportioned. The object in view is to give the dose in such amount and at such intervals as will produce the most transient negative phase and the most enduring positive phase.

Veterinary Phylacogens

are remedies somewhat akin to Bacterial Vaccines or Bacterins. They are sterile aqueous solutions of metabolic substances, generated by bacteria grown in suitable media, from which the bacteria, after being killed, are removed by filtration through porcelain. Herein they differ from bacterins, which are suspensions of killed bacteria.

Phylacogens also differ from serums, because they are not obtained from the blood of living animals and they do not contain pre-formed antibodies, but supply bacterial antigens which are capable, when injected subcutaneously, of stimulating the body cells to produce protective antibodies.

It has been shown that when Phylacogens are injected intravenously the number of leucocytes is doubled within three or four hours.

Extensive use of Phylacogens by the veterinary profession has called forth many striking testimonies to their great therapeutic value, even in cases which have failed to respond to treatment with stock vaccines, serums or antitoxins.

Choice of a Suitable Bacterial Remedy.—It may sometimes be a matter of uncertainty as to whether a bacterial vaccine or a serum or a Phylacogen should be used in a given case, and the following suggestions may serve as a useful guide.

Serums give the best results in acute general infections when the condition of the patient is such that it cannot produce antibodies and it is necessary to supply them from without by the injection of antitoxin or of antibacterial serum.

Bacterial vaccines (bacterins) find their greatest field of usefulness as prophylactic agents. As a therapeutic agent, at the onset of an infectious process when the disturbance is generally local, the prompt use of a suitable bacterial vaccine stimulates the production of antibodies in the blood of the patient and thus increases the resistance to the infection.

In other words, serums are capable of conferring only a temporary passive immunity, but bacterins engender active immunity of much longer duration.

The action of phylacogens differs from that of serums but is more nearly allied to that of bacterins, with the very important advantage that they supply antigens in an immediately available condition as distinct from bacterins, where antigens are only gradually set free from the bacterial cells by autolysis after being injected into the tissues. Their therapeutic action is thus akin to that of bacterins in that they promote the production of antibodies in the patient's system, but their effect is much more prompt.

Immunogens.—In the preparation of Immunogens the live virulent organisms, immediately on being taken from the solid culture medium on which they have grown, are agitated for a few minutes in physiological salt solution and the suspension is at once clarified by passage through a super centrifuge. This rapid extraction of the antigen prevents the formation of bacterial autolysates known to be more or less toxic. (*See page* 23).

Gland Products.

In this class are included Adrenalin, the hormone of the suprarenal gland (introduced by Parke, Davis & Co. in 1901) ; Pituitrin, a solution of the active principles of the infundibular portion of the pituitary gland (introduced by Parke, Davis & Co. in 1908) ; also, though these may be of less interest in veterinary than in human ailments, preparations of the thyroid and parathyroid glands and of the ovary.

VETERINARY SERUMS.

ANTI-ANTHRAX SERUM (P., D. & Co.).

Obtained from the blood of animals that have been immunized against several strains of the Bacillus anthracis and employed in the prophylaxis and treatment of anthrax in cattle, horses and mules. Supplied in vials containing 30 c.c. (Bio. 710).

This preparation is employed both for prophylactic and curative treatment. For the former purpose the most effective method is the simultaneous injection of the Serum and Anthraxoids (*see page* 24). The serum confers immediate passive immunity against infection and also protects the animal against pronounced vaccine reaction when the Anthraxoid is injected. Thus any animal that may have the infection in the incubation stage is more successfully protected than is possible with any other method.

When the disease has invaded a herd of animals, or when the latter have been exposed to virulent infection, it is sometimes unwise, even unsafe, to attempt to immunize with Anthraxoids alone. Simultaneous treatment with serum and vaccine is then indicated, 10 c.c. of Serum being injected beneath the skin of the shoulder, and in the case of animals showing a normal temperature, one No. 2 Anthraxoid may then be injected into the other shoulder. The Anthraxoid should not be given to any animal showing a high temperature, but if the latter should subside in a few days, the Anthraxoid should then be given.

In the treatment of cattle and horses showing symptoms of anthrax large doses (30 to 100 c.c.—1 to 3 ounces) are required, the dose to be repeated within twenty-four hours if the animal does not show signs of improvement. The dose for a sheep is 10 c.c.

ANTI-DISTEMPER SERUM (CANINE) (P., D. & Co.).

Obtained from the blood of animals that have been immunized against several strains of *B. bronchisepticus* (Ferry), the causal organism of canine distemper. Employed both in treatment and prophylaxis of all forms of distemper in small animals, including the dog, cat, monkey, rabbit, guinea-pig, ferret, etc. Supplied in boxes containing 6 bulbs of 5 c.c. (Bio. 730).

The Etiology of Distemper.—Ferry has shown that in the early stage of canine distemper a bacillus which he has named *B. bronchisepticus* is always present in the animal's bronchi and trachea (*see page* 16), although in later stages of the disease infection by other microbes takes place, and may assume predominance.

Ferry has proved that dogs may be rendered immune to distemper by the injection of a bacterin (*see page* 16) prepared from *B. bronchisepticus*; while the same bacterin in smaller doses in association with staphylococci and streptococci of canine origin gives excellent results in the treatment of the disease, provided that it is used in the early

stage. Too often, however, the case is not seen until the dog is so ill that its system can scarcely respond to a vaccine and produce sufficient antibodies to combat the toxins produced by the infecting microbes. In such a case the supply of the antibodies, ready formed, as provided in Anti-Distemper Serum (P., D. & Co.) will be of the utmost value.

Use in Treatment.—Anti-Distemper Serum (P., D. & Co.) has been found by a number of prominent veterinary surgeons to have remarkable therapeutic value in cases of canine distemper. The dose is 5 c.c. hypodermically injected, as slowly as possible, daily, while necessary; in severe cases that amount should be given twice daily. It may safely be given in any stage of the disease. A small dose of Canine Distemper Mixed Bacterin every third day, will be a valuable auxiliary to the serum in all cases.

Use in Prophylaxis.—Anti-Distemper Serum (P., D. & Co.) is also of value for preventing an attack of distemper in dogs which may have been exposed to infection, or for moderating the symptoms if the infection is already present in the incubatory stage. The serum supplies immunizing bodies similar to those found in the blood of a dog that has got safely over distemper. A dose of 10 c.c. should be given on one or two days, after which a prophylactic course of Canine Distemper Bacterin (*see page* 16) should be commenced, 5 c.c. of Anti-Distemper Serum being given simultaneously with each dose of the Bacterin. Should the disease declare itself, the serum must be given daily as indicated in the preceding paragraph.

ANTI-INFLUENZA SERUM (EQUINE) (P., D. & Co.).

Obtained from the blood of horses which have been immunized against Streptococcus equi (Diplococcus pneumoniæ, Schütz). Supplied in vials containing 30 c.c. (Bio. 891).

Anti-Influenza Serum (Equine) is employed both for prophylaxis and treatment of febrile diseases of bacterial origin in horses and mules, particularly **influenza** (pink eye, catarrhal fever or shipping fever), with its complications or sequelæ of **cough, laryngitis, bronchitis, strangles, pneumonia and purpura hæmorrhagica.** It reinforces the disease-resisting powers and tends to neutralize the toxins in the blood, checks loss of flesh, restores appetite, expedites recovery, and usually confers immunity from recurrence.

Before this remedy was placed on the market it was subjected to exacting tests over a period of eight years, aggregating 22,000 doses, which showed a reduction in the mortality rate from 12% to 1·75% whilst the duration of illness in horses more or less severely affected was only 50%, and the loss in weight only 25%, of that which was usual.

As a prophylactic, a dose of 30 to 90 c.c. should be given one or two days before the animal is shipped, exhibited or otherwise exposed to possible infection. A course of Streptococcus-Staphylococcus

Bacterin (Equine) (P., D. & Co.) (*see page* 21), in addition to the serum, increases the degree and duration of protective immunity, and is strongly to be recommended when time permits of a clear interval of three days between the last dose of bacterin and possible exposure to infection.

As a curative agent, one or two doses of 60 to 90 c.c., given twelve hours apart, will generally prove sufficient *if given during the early stage.* A third dose may be given if necessary. If temperature and pulse-rate do not go down, and the patient evidently improves, the dose should be repeated at twelve-hour intervals whilst necessary.

Administration.—In urgent cases Anti-Influenza Serum should be injected intravenously; by this method a more prompt effect is obtained. The best site for the injection is in the jugular vein, midway between the shoulder and the head of the animal on the left side. After the contents of the syringe have been discharged, it is wise to allow the needle to remain in place for a few moments to permit the circulating blood to take up the antitoxin and carry it away. After the needle is withdrawn, the skin at the place of injection should be compressed, and when bleeding ceases, the site should be swabbed with an antiseptic solution. All apparatus must be carefully sterilized before and after use.

In early cases, also in prophylactic administration, subcutaneous injections with due aseptic precautions will be quite suitable.

ANTISTREPTOCOCCIC SERUM (EQUINE) (P., D. & Co.).

Obtained from the blood of horses which have been immunized to highly virulent cultures of various strains of streptococci. The serum is passed through sterilised filters and subjected to the most rigid bacteriological and physiological tests to ensure the absence of germs or other contamination. Supplied in vials of 30 c.c. (Bio. 723).

Physiological Effects.—Biological experiment shows that the injection of Antistreptococcic Serum is regularly followed by an increase in the phagocytic power of the leucocytes of the blood; it is evident therefore that the serum has both protective and curative value. In severe cases of streptococcal infection, injections of the serum are followed by rapid clinical improvement, coincident with a marked increase in the opsonic index of the blood.

Indications for Use.—Favourable results are reported from the use of this serum in severe forms of streptococcal infection, such as occur in **pyæmic arthritis and general septicæmias,** also in **strangles, bronchitis, pneumonia, influenza and other conditions** which may be primarily due to the invasion of streptococci or aggravated by complications attributable to their presence. It is also of great value **as a prophylactic** in circumstances which **predispose to streptococcal** infection.

Mode of Administration.—The serum is administered subcutaneously

after the skin has been shaved, and scrubbed with Germicidal Soap (P., D. & Co.), Ethereal Antiseptic Soap (P., D. & Co.) or a 5% carbolic acid solution. From 10 to 60 c.c. of serum should be injected with a carefully sterilized syringe. The dose may be repeated every six to twelve hours according to the symptoms. In localised streptococcal infections, as in joints, serous cavities and soft tissues, the serum may advantageously be injected directly into and about the seat of infection.

References to some Clinical Reports.

In the *Veterinary News* of April 3, 1915, Mr. E. Wallis Hoare reports two cases in which Parke, Davis & Co.'s Antistreptococcic Serum proved curative. The first was a case of **strangles** in an aged thoroughbred brood mare. On the first day of treatment—temperature 103·5° F.—1 ounce of the serum was injected hypodermically. On the next day, the temperature was 101°, the animal was brighter and able to feed ; the dose of serum was repeated. Thereafter the animal made a steady recovery. The only drugs used were a little chlorate of potash in the drinking water, and a belladonna electuary. The second case was one of **metritis complicated with mastitis** in an aged brood mare. After two days of antiseptic treatment of the uterus, the temperature registered 104° F., and 1 ounce of Parke, Davis & Co.'s Antistreptococcic Serum was injected subcutaneously. Six hours later the temperature had fallen to 102° F., and on the following day the contents of the uterus were free from odour, the udder was less painful and the swelling had gone down. Three days later the animal was quite well.

The injection of this serum is reported to be very effective as a prophylactic of **pyæmic arthritis (joint-ill)** in foals (Peggie, *Veterinary Record*, Nov. 16, 1918, page 164). For this purpose, each in-foal mare should be given 1/2 ounce of the serum, hypodermically, on the 10th and also on the 3rd day before the expected date of foaling, and to each foal an injection of 1/4 ounce of the serum should be given within from 24 to 48 hours after birth, and a similar dose a week later.

In a more recent report (*Veterinary Record*, Jan. 1, 1921), Mr. Peggie gives his experience of prophylactic treatment during the spring and summer of 1920, when most satisfactory results were obtained. He also reported very good results in the treatment of **joint-ill**, giving 1 ounce of the serum for the initial dose and half an ounce on each succeeding day whilst necessary. It cannot be too strongly emphasised that it is necessary for purposes of treatment to inject a case in the initial stages of the disease.

Mr. Munro (*Veterinary News*, June 2, 1917) writes as follows :—" Six years of treating the mares has convinced me that the absence of **joint-ill** in Shire breeding studs where there were formerly three or four foals dying every year is due to treating the mares before the foals are born."

A veterinary surgeon reports in *Veterinary Notes* (Detroit, June, 1913) a case of **puerperal metritis** in a bitch (Great Dane). Temperature 105·5° F., very putrid discharge from the uterus. Uterine injections of diluted hydrogen peroxide solution were given every three hours. On the third day when the temperature was 106° F., 10 c.c. of Anti-streptococcic Serum were administered, also four-hour injections of normal saline, subcutaneously. This treatment was continued and the animal made a good recovery.

At a meeting of the South Durham and North Yorkshire Veterinary Medical Association, Mr. Dawes stated that he had found Antistreptococcic Serum highly beneficial in cases of **influenza**, particularly when accompanied by suppurating glands of the throat and maxilla. He would not like to be without the serum when dealing with **bastard strangles,** and in **poll-evil, fistulous withers, and other suppurating conditions** he had found it valuable.

ANTITETANUS SERUM, VETERINARY (P., D. & Co.).

(Also known as Tetanus Antitoxin.)

Obtained from the blood of horses which have acquired a high degree of immunity to tetanus in consequence of repeated injections of the specific toxin in gradually increased amounts. Purity and potency are assured by elaborate bacteriological and physiological tests. The potency is determined by the amount of tetanus toxin which the serum will counteract when both serum and toxin are injected into a guinea-pig. Each single antitetanus unit represents ability to protect the life of a guinea-pig of 350 grammes weight for 96 hours against 1,000 times as much toxin as would ordinarily be fatal to it. If kept in a cool place the serum will retain its potency for two years. Supplied in vials containing 500 U.S.A. units (Bio. 748), 3,000 U.S.A. units (Bio. 740), 5,000 U.S.A. units (Bio. 749), and 10,000 U.S.A. units (Bio. 751).

Antitetanus Serum (Veterinary) is now highly concentrated. It should be borne in mind that the United States unit is double the strength of the international unit, and P., D. & Co. serum therefore occupies much less volume unit for unit than Continental serums.

Prophylactic Uses.—Even trivial punctured wounds and injuries to the feet are frequently followed by tetanic symptoms ; a prophylactic injection of Antitetanus Serum is a wise precaution in all such cases, and is imperative in wounds soiled with manure or other material likely to harbour the tetanus spores. Some veterinary surgeons, particularly in neighbourhoods where tetanus is frequent, take the precaution to administer this serum **as a prophylactic** to animals about to be operated upon. The immunity conferred lasts about two or three weeks, and a second dose should be given two weeks after the first.

Antitetanus Serum is no longer in the experimental stage ; it has been abundantly proved that if the serum is injected immediately or soon after the wound has been received, and again on the eighth or tenth day, it will prevent a fatal issue. Prophylactic doses of 1,500 units,

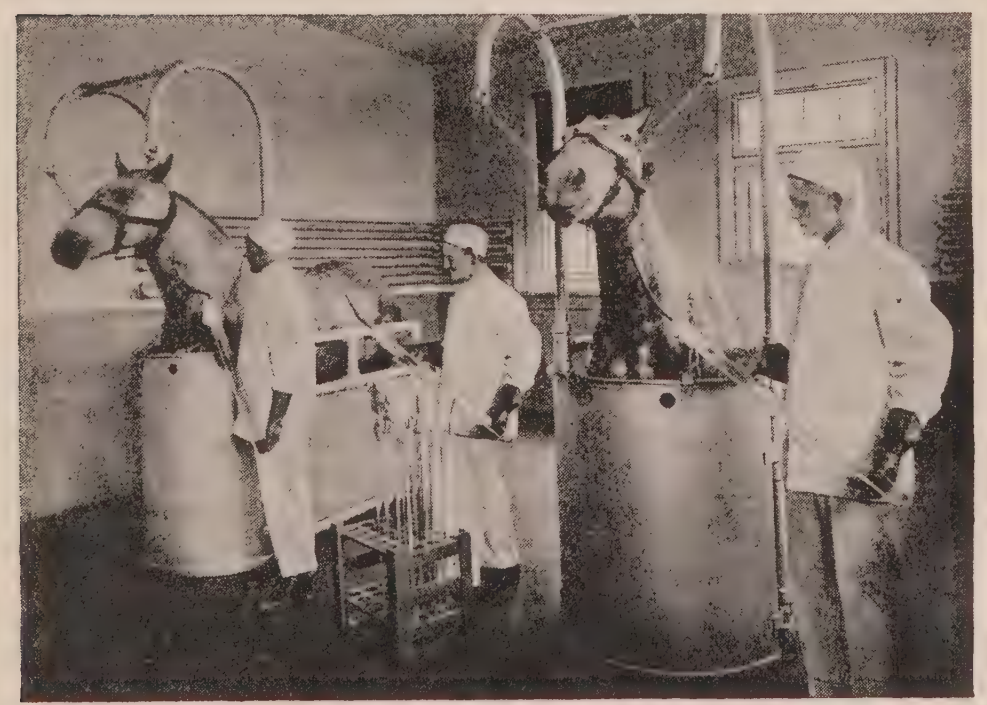
given as above, are certainly effective, and there are good grounds for considering that two doses of 500 units, if the first is given early, are sufficient for the prevention of tetanus in horses of any age. Even should some hours have elapsed after an injury before the remedy can be administered it should nevertheless be given (part subcutaneously and part intramuscularly, in the neighbourhood of the wound) in any case in which there is reason to fear that infection with tetanus bacilli may have taken place. Whilst it is comparatively easy to neutralize the toxin at the time of infection, it is said that after the disease is fully developed it takes from 1,000 to 100,000 times as much antitoxin to overcome the toxæmia ; hence the importance of injecting a large initial dose as soon as symptoms are observed and the desirability of always keeping a supply of serum at hand ready for immediate use. The incubation period is from 5 to 14 days, and the shorter the interval between the time of injury and the development of symptoms the graver is the prognosis.

Early Prophylactic Administration most Desirable.—The toxin produced by the tetanus bacillus has a special affinity for nerve tissue, and its neutralization by Antitetanus Serum can only be attained before it becomes fixed in those tissues, therefore the early administration of a prophylactic dose of the serum in suspected cases is of vital importance. If the antitoxin is given late, the system may have become so loaded with toxins that the disease will develop, but even so the prognosis will be much better than if no antitoxin had been given.

Use when the Disease has Developed.—Immediately on the appearance of symptoms, at least 5,000 units should be injected and repeated every six to twelve hours, or oftener, according to conditions, until recovery is assured. It must be borne in mind that the appearance of symptoms proves the presence of a very large and *constantly increasing* quantity of toxin elaborated by the tetanus bacillus, and a free use of the antitoxin is imperative in order to counteract it. One or two large doses (10,000 to 20,000 units) are much more efficacious than a series of small doses. The larger the initial dose the more prompt will be the neutralization of toxin and the sooner will the animal be capable of resuming work. Some authorities recommend the *slow* intravenous injection of from 8,000 to 16,000 units (according to the size of the animal) as more effective than hypodermic administration, the dose to be repeated after an interval of five days if a cure has not resulted from the first.

A veterinary surgeon recommends that no matter how bad a horse is the serum should be injected. If the horse is on the ground it is essential that he should be got on his legs. Give him 6 grains morphine and ¼ grain atropine, then raise and place him in slings. Immediately he is in slings and at rest give the serum ; it is of little use injecting it while the horse is on the ground owing to the rigidity of the animal's muscles.

INOCULATING SERUM HORSES.



BLEEDING SERUM HORSES.

Mode of Administration.—The serum should be injected with a sterilised syringe either intravenously or beneath the loose skin of the lower region of the neck, also in the neighbourhood of the wound, the site having first been shaved, and then rendered aseptic by means of Germicidal Soap, Soft (P., D. & Co.), Ethereal Antiseptic Soap (P., D. & Co.), or a 5% solution of carbolic acid.

Other Necessary Measures.—In addition to the use of the serum, prompt surgical treatment of the wound must be adopted. It is necessary to lay the wound widely open, because the tetanus bacillus is anærobic, and will thrive in pockets of pent-up fissures. Every particle of foreign matter should be most carefully removed and the wound freely irrigated with Hydrogen Peroxide Solution (P., D. & Co.). The wound must be kept open, and proper drainage must be ensured. Large and frequent doses of potassium bromide in the drinking water are of assistance in controlling spasms, and a brisk cathartic is also beneficial. Fluid Extract of Cannabis in one ounce doses, by the mouth every two hours while spasms continue, is also a valuable sedative. (*See also* Chloretone, *page* 59.)

In preliminary treatment of punctured wounds of the soles of the feet of horses a little pure carbolic acid injected into the wound is valuable in that it saves cutting away the sole and thereby exposing healthy laminæ. Then as a prophylactic inject subcutaneously 1,500 units of Antitetanus Serum, and repeat in ten days.

References to some Clinical Reports.

A Canadian veterinary surgeon reports that he always administers the serum intraspinally and has cured in this way 29 out of 30 severe cases, which he believes would not otherwise have recovered. After sterilising the part and inducing general or local anæsthesia, he inserts a trocar and cannula between the last lumbar and first sacral vertebræ, draws off a quantity of spinal fluid and injects from 25,000 to 75,000 units according to the severity of the case. If indicated the process is repeated after 12 to 24 hours.

In a paper reported in the *Veterinary Record*, May 28, 1927, Professor J. McCunn, M.R.C.V.S., stated that for Antitetanus Serum to be of use as a curative agent it must be given in large doses, and in such a way that it can be absorbed readily and reach the central nervous system. In the human subject these conditions are fulfilled by injecting the serum into the subdural space of the spinal cord, but in the horse intraspinal injection is so impracticable that the intravenous route must be selected as the next best alternative ; he therefore gives an intravenous dose of Antitetanus Serum varying from 18,000 to 40,000 units, according to the severity of the case, and this dose is repeated the following day if necessary.

Mr. McCrea reported in the *Veterinary Record* of January 21, 1922, 23 recoveries out of 27 cases of tetanus in horses treated with P., D. &

Co.'s serum. In the *Veterinary Journal*, July, 1922, Mr. Richardson describes another cure, and Mr. De Ville, in the *Veterinary Record* for April 7, 1923, mentions 3 cures out of 4 cases treated.

A Professor of Veterinary Surgery informs us that he is convinced that if Antitetanus Serum were injected *intravenously* in sufficient doses a cure might be expected in every case. He himself has had a large number of successful cases. He administers from 75 c.c. to 150 c.c. (8,000 to 16,000 units), according to the size of the horse, for the first dose, intravenously, and if marked improvement is not evident in five days, he repeats the dose, though he rarely finds that this is necessary.

ANTI-WHITE-SCOUR SERUM (BOVINE) (P., D. & Co.).

Obtained from the blood of horses which have been immunized with gradually increasing doses of polyvalent cultures of *Bacillus coli* (*bovine*) isolated from cases of white scour. The activity of the serum is established by carefully conducted agglutination tests. It is adapted for prophylactic administration to new-born calves, foals, pigs or lambs, also for treatment of the disease. Supplied in vials containing 10 c.c. (Bio. 716), or 30 c.c. (Bio. 717).

The acute infectious disease known as white scour, characterised by a profuse greyish-white diarrhœa, and accompanied with depression and exhaustion, is responsible for a very high mortality, particularly amongst calves. Ordinary medication has proved of little value in combating this disease, but it has been found that injections of from 10 to 20 c.c. of a properly prepared polyvalent serum will often confer sufficient passive immunity to protect the calf during the susceptible period. Occasionally a calf with unusually low natural resistance, if constantly exposed to infection, may not be fully immunized by a single prophylactic dose of the serum, but in such a case it is reasonably certain that an attack would be only mild in character. The serum may also be used therapeutically; it has been amply proved that if it is administered at an early stage it is capable of overcoming the disease.

It must be borne in mind that while the great majority of cases of white scour in calves are the result of infection with B. coli, other organisms may, in occasional instances, be the causative or complicating factors, in which event Mixed Infection Phylacogen (*see page* 31) or Nuclein (*see page* 74) might be a useful adjunct to the serum treatment. If there is evidence of navel infection complicating the condition, Antistreptococcic Serum (*see page* 7) should be given in addition to the Anti-White-Scour Serum. In chronic cases, Colon Bacterin may usefully be employed.

Prophylactic Dose.—Calves born in herds in which white scour is present should be given, as a prophylactic, a hypodermic injection of from 10 to 20 c.c. of Anti-White-Scour Serum as soon as possible after birth, and the dose should be repeated if any symptom of the disease appears.

Curative Doses.—Immediately upon manifestation of symptoms in calves or foals, from 20 to 30 c.c. of the serum should be given hypodermically, and this dose should be repeated whilst necessary at intervals of six to twelve hours, as indicated by the symptoms. The dose for pigs and lambs is 5 c.c.

Successful results depend upon the injection of the serum in the *early stage* of the disease, or (when used prophylactically) as soon as possible after birth in calves of herds in which white scour is known to exist. Therefore the remedy should always be kept at hand ready for use when called for.

This serum is reported to prevent or cure the pneumonia and arthritis which often accompany white scour.

Anti-White-Scour Serum is also given to pregnant cows in herds where calving troubles are frequent. The dosage employed is 30 c.c. per day for three days prior to calving. It is stated that this procedure enables the placental membranes to be readily expelled and also inhibits the development of metritis and similar infections of the genito-urinary tract.

Clinical Reports.

Mr. Scott, writing in the *Veterinary Record* of April 29, 1916, on the treatment of **white scour**, says that passive immunization by the use of a polyvalent hyper-immune serum bids fair to give good results, and, he adds, " I have robbed several outbreaks of their normally high casualties by the early use of a serum prepared by Parke, Davis & Co."

An M.R.C.V.S. writes with reference to this serum : " The last six calves inoculated for white scour in a herd where previously twelve had died of the disease, showed no symptoms of the trouble and have gone on well ever since" (*Veterinary Notes*, London, Sept., 1919).

HEMOPLASTIN (HÆMOSTATIC SERUM) (P., D. & Co.).

This sterile serum derivative, discovered by Dr. Lapenta, is a combination of blood coagulating agents in physiologically balanced solution. It is an amber-coloured fluid adapted for subcutaneous injection or for topical application in the treatment of hæmorrhage. Supplied in bulbs of 2 c.c. (Bio. 70) and 5 c.c. (Bio. 72).

The preparation of Hemoplastin is based on the principles controlling blood coagulation. The formation of blood clot depends on the production of fibrin from the fibrinogen of the blood, through the action of the ferment, thrombin. Thrombin does not exist as such in the blood, but is present as prothrombin, in which antecedent state it is kept by the action of antithrombin. When antithrombin is neutralized by certain thromboplastic substances the thrombin is released and, acting upon the fibrinogen, brings about the phenomenon of the blood clot. Hemoplastin contains prothrombin, without any antithrombin, which if present would vitiate the action of the prothrombin.

The determination of the hæmostatic effects of Hemoplastin has been based on laboratory and clinical experiments. Laboratory tests included determinations of the coagulating effect on blood plasma, the hæmostatic action on wounds, both external and of the viscera, by local application and parenteral injection; ability to increase the coagulability of the blood by subcutaneous injections, and special tests to determine whether or not the use of Hemoplastin was attended with any dangerous possibility such as thrombosis.

The results of this work showed conclusively that Hemoplastin surpasses in hæmostatic action any of the other coagulating agents used. Repeated efforts were made to produce thrombosis in both rabbits and dogs by the injection of very large doses intravenously, but in no case were they successful.

The clinical investigation of Hemoplastin included its use in the various types of hæmophilia, purpura hæmorrhagica, pulmonary hæmorrhage, and a great variety of surgical operations. The favourable results in practically all of these cases were most impressive and in no instance was there any evidence of toxic effect.

Indications for Use.—The injection of Hemoplastin is indicated in the treatment of all types of **hæmorrhage,** particularly those depending upon faulty coagulation of the blood. It has given highly satisfactory results in **pulmonary hæmorrhage, purpura hæmorrhagica, hæmorrhage in Stuttgart disease, intestinal bleeding** and hæmorrhage incident to surgical operations. The serum is also very effective when applied on sterile gauze to bleeding surfaces.

In cases of **purpura hæmorrhagica** the following treatment is suggested in order to lessen, or prevent, extravasation of blood into the tissues, through the combined action of contracting the arterioles and increasing the coagulating power of the blood:—Hemoplastin subcutaneously; Nuclein Solution intravenously; Adrenalin Chloride Solution subcutaneously; Digitalis and Strychnine orally or subcutaneously.

Dosage.—The dose for a dog is 1 to 2 c.c. (other animals in proportion) to be given subcutaneously with due aseptic precautions, and repeated every four to six hours until perfect control of bleeding is established.

Mr. Hewetson reports in the *Veterinary Journal* for October, 1924, a case of serious internal hæmorrhage in a dog that had been run over. The animal was in extreme collapse, heart just beating. Two c.c. of Hemoplastin were injected hypodermically, also 3 grains of camphor in oil. There was no indication of further hæmorrhage and the dog made a good recovery.

A veterinary surgeon informs us that by the use of Hemoplastin he has saved the lives of four dogs out of five suffering with **Stuttgart disease.** His method was to inject 1 c.c. of Hemoplastin twice a day on three consecutive days.

VETERINARY BACTERINS.

CANINE DISTEMPER MIXED BACTERIN (P., D. & Co.).

A polyvalent bacterin each c.c. of which contains: B. bronchisepticus (canine) 3,000 million ; Staphylococcus albus and aureus (canine) of each 300 million ; Streptococcus (canine) 400 million, sterile and ready for immediate use, for the prevention and treatment of canine distemper. Supplied in sets of 3 graduated doses (prophylactic treatment for one dog) (Bio. 832), in vials containing 10 c.c. (Bio. 805) and in tablets each representing 0·5 c.c. of fluid bacterin, vials of 20 tablets (Bio. 808).

The *Bacillus bronchisepticus* is the organism isolated from cases of canine distemper by N. S. Ferry in the Parke, Davis Research Laboratory in 1908, and believed by him to be the primary causative factor of this disease. The isolation of an organism identical with the B. bronchisepticus was also accomplished independently and almost simultaneously by McGowan working in Edinburgh and Torrey in New York.

Ferry found that it was possible to isolate this organism from the smaller bronchi and frequently from the trachea in the early stages of canine distemper. At a somewhat later stage of the disease it was found that, in the larger bronchi and in the trachea, it was contaminated with pus-forming organisms.

More recently, Kondo in Japan has reported that he has demonstrated the presence of the B. bronchisepticus in 85 per cent. of distemper cases ; in 50 per cent. it was in the pure state, but in the remaining 35 per cent. it was associated with streptococcus, staphylococcus and even B. coli, although the bronchisepticus was always the predominating micro-organism (*Veterinary Journal*, August, 1924).

Whether or not all types of distemper can be assigned to infection with the B. bronchisepticus has been questioned in some quarters, but there is ample evidence to show that a bacterial vaccine prepared from canine strains of the bronchisepticus, together with staphylococcus and streptococcus, is capable of conferring an immunity against the disease in a very large number of cases.

The bacterin is issued in two forms, as a suspension of the killed organisms in normal saline solution, and in a dry state as hypodermic tablets.

Liquid.—The suspensions of the dead micro-organisms are diluted to a standard strength, and these so combined that the resulting mixture contains the desired number of organisms per c.c. The product is preserved with cresol.

Tablets.—In the preparation of the tablets the bacterial suspensions are dried, and the organisms then combined with a suitable tablet base so that each tablet represents 0·5 c.c. of the liquid bacterin.

Therapeutic Indications.—This bacterin is indicated as a prophylactic and curative agent in all forms or types of canine distemper and sequelæ.

Prophylactic treatment should be started early enough to allow the full course of injections to be completed at least three weeks before probable exposure, as in the case of dogs to be taken to a show. When used as a curative agent the bacterin treatment should be started as early in the disease as possible. In no case should the appropriate medicinal, dietetic and hygienic treatment be neglected. These are essential for the prompt and full recovery of the patient.

Directions for Use.—Either the liquid bacterin or a solution made by dissolving one or more of the tablets in sterile water is injected subcutaneously by means of a previously-sterilized hypodermic syringe. Before withdrawing the bacterin from the vial, the surface of the rubber cap should be wiped with a germicidal solution. To fill the syringe, withdraw the piston part way (if it is desired to withdraw 1 c.c., pull the plunger back slightly past the 1 c.c. mark), then insert the needle through the cap and push the plunger gently, so as to introduce more air into the vial, without using sufficient pressure to loosen the cap. By thus increasing the pressure in the vial, it will be found that the syringe fills very readily on withdrawing the piston, there being no partial vacuum to overcome. The puncture made by the needle is self-sealing, and if the instrument is *sterile*, the contents remaining in the vial will not be contaminated.

Dosage.—For the initial prophylactic dose 1 c.c. of liquid bacterin or two tablets may be considered safe for a healthy dog of 20 lb. weight. For smaller or larger animals the dose must be decreased or increased accordingly. Injections may be made at three- to four-day intervals, increasing each dose according to the condition of the patient. Curative treatment should be pushed more gradually than prophylactic treatment, as a general rule. A suggested schedule of dosage for a dog weighing 20 lb. is as follows :—

Canine Distemper Mixed Bacterin.	*In Prophylaxis.*		*In Treatment.*	
	Liquid.	*Tablets.*	*Liquid.*	*Tablets.*
1st dose	1·0 c.c.	2	0·25 c.c.	½
2nd dose	1·5 c.c.	3	0·5 c.c.	1
3rd dose	2·5 c.c.	5	1·0 c.c.	2

If further treatment is required the dose should be increased by 0·5 c.c. (or 1 tablet) on each occasion.

Half the above doses should be given to small puppies or small dogs of delicate breeds, and should be followed by a course of full doses from three to six months later.

Hamilton Kirk considers that the best age for prophylactic inoculation is at 7 or 8 weeks and recommends that the puppy **should be isolated during the inoculation period and for two weeks after** to preclude contact with infection before immunity is fully established (*Veterinary Record*, July 21, 1923).

Care must be exercised when *inoculating dogs that have recently been exposed to infection* and may, therefore, be harbouring the disease in its incubation stages; in these circumstances, one or more doses of Anti-Distemper Serum (*see page* 5) should be given and then *small* doses of Bacterin as recommended for treatment.

In the *treatment* of distemper the best results will be obtained if 5 c.c. of Anti-Distemper Serum is given with each curative dose of Bacterin, and if indicated 5 c.c. of the Serum may be given once or more in the intervals between the doses of Bacterin. Appropriate medicinal, dietetic and hygienic treatment are essential for satisfactory results (*see page* viii).

Reaction to the Bacterin.—A certain degree of reaction may follow the injection—the dog may appear to be worse, and the symptoms more pronounced. This reaction, or "negative phase," should not cause alarm or the discontinuance of treatment; it is an indication that the animal organism is responding to the treatment. If the reaction is very severe, however, it may be well not to increase the size of the dose, but to continue the last, or even a lesser dose, until only a moderate reaction is produced, when the ascending scale may be again resorted to.

Clinical Reports.

Mr. Young states that though previously he had always had great difficulty in the treatment of distemper, during the last twelve months he had met with great success from using Canine Distemper Mixed Bacterin with appropriate medicinal remedies (*Veterinary Record*, May 12, 1922).

An F.R.C.V.S. writes:—"I have used your Canine Distemper Bacterin as a prophylactic agent for a period extending over two years in 150 young dogs with eminently satisfactory results. . . . In no case have any untoward symptoms appeared as a result of the use of the bacterin, and in only three animals out of 150 treated did any sign of distemper appear, these having doubtless been infected prior to the injection of the vaccine. These three recovered easily and quickly."

Stuttgart Disease.—An M.R.C.V.S. reports considerable success with Canine Distemper Mixed Bacterin (P., D. & Co.) in the treatment of **Stuttgart Disease.** His experience has been that one dose will usually stop the necrosis of the tongue and buccal membrane in twelve hours.

Mr. Lancaston reports in the *Veterinary Record*, December 10, 1921, that he has had the best results from the use of Canine Distemper Mixed Bacterin and medicinal treatment (paraffin, bismuth and pepsin).

Feline Distemper.—Several authorities have stated that natural transmission of distemper from the dog to the cat and *vice versa* has never been known, notwithstanding the fact that the disease is admittedly contagious and inoculable, although Ferry considers that the etiological factor of distemper in the cat is identical with that of canine

distemper, and that Canine Distemper Mixed Bacterin (P., D. & Co.) is quite as effective in the case of cats as it is for dogs.

Writing on the treatment of feline distemper, Hamilton Kirk says " Anti-Distemper Serum (Parke, Davis & Co.) has often been found of assistance as a therapeutic measure." (*Diseases of the Cat*, 1925.)

Distemper in the Pig.—McGowan reports an epidemic amongst pigs which exhibited many of the symptoms of canine distemper and in which the B. bronchisepticus was found in the trachea and bronchi. A vaccine containing this organism was used with good results (*Veterinary Record*, June 3, 1922).

COLON BACTERIN (EQUINE) (P., D. & Co.).

This bacterin is supplied in the convenient and stable form of soluble tablets, which are prepared from cultures of *Bacillus coli communis* of equine origin sterilised by heat, and incorporated with a soluble base in such proportions as to give 1,000 millions of killed bacteria in each tablet. Supplied in vials containing 10 tablets (Bio. 761).

Indications for Use.—B. coli communis and its allies are sometimes responsible for such conditions as **peritonitis, cystitis, urethritis, renal abscesses** and **enteritis.** The use of colon vaccine is specially indicated in these conditions, also for **anal fistula, catarrhal jaundice** and **abdominal abscesses.**

Dosage.—The initial dose of Colon Bacterin (Equine) for a horse is 1 tablet of 1,000 millions of killed bacteria, dissolved in about 5 c.c. (85 minims) of sterile distilled water and injected subcutaneously with due aseptic precautions. The injection should not be made in the immediate area of infection, but at a reasonable distance away—the loose skin of the neck, midway between head and shoulder, is a good site unless the infection is centred there. The dose may subsequently be increased, up to two or more tablets, according to the general clinical conditions and the reaction produced by the previous injection. Ordinarily, from three to five days is a suitable *interval* between doses. but all effects of a previous injection should be allowed to pass off before another dose is given. The extent of the reaction will also serve as a guide to the *size* of the dose ; if the reaction is severe the dose should not be increased (it may even be best to reduce it) on a subsequent occasion until it is well borne and an increase can safely be ventured upon.

In acute cases the injection of the polyvalent colon bacillus antiserum known as Anti-White-Scour Serum (*see page* 13) may be a useful auxiliary to bacterin treatment.

Colon Bacterin may be employed in proportionate doses for other domesticated animals also. If less than 1,000 millions of killed bacteria are required, a proportionate section of the tablet may be used, or the

whole tablet may be dissolved in sterile distilled water, and a proportionate amount of the solution injected.

In the *Veterinary Journal* for September, 1915 (p. 440), Mr. Tutt reports a case of chronic diarrhœa in a horse, which all medicinal remedies had failed to arrest, the animal having consequently become very emaciated, though its appetite was good. No intestinal parasites could be detected. A dose of 500 million Colon Vaccine, Veterinary (P., D. & Co.), was injected, and repeated after four days. Subsequently, 1,000 million were given every three days for a period of six weeks, by which time the general condition had become normal. No recurrence has taken place.

MIXED INFECTION BACTERIN (BOVINE).

Each c.c. contains : Streptococci, 10,000 million ; Staphylococci, 7,500 million ; B. abortus, 5,000 million ; B. coli, 2,500 million. The average dose for cattle is 2 c.c., which may be subsequently increased, provided there is no reaction. Supplied in vials containing 20 c.c. (Bio. 835).

Indications for Use.—In herds where outbreaks of **streptococcal mastitis** frequently occur, Mixed Infection Bacterin (Bovine), is indicated as a prophylactic as well as a curative agent. The same may be said of herds where **metritis** frequently follows parturition, or where **retained placenta** is of common occurrence. This bacterin is also indicated in other diseased conditions of the reproductive organs resulting from infection by pathogenic micro-organisms.

A veterinary surgeon in the South-West of England who has employed Mixed Infection Bacterin (Bovine) for use in the treatment of bovine mastitis reports that he considers this preparation of value, provided it is used in the early stages of the disease.

With the aid of Dibromin (*see page* 104) for irrigation purposes, he says that he has cured five cases, the udders of all the animals treated being now functionally active.

STAPHYLOCOCCUS-STREPTOCOCCUS BACTERIN (CANINE),

for Suppurative Conditions.

Each c.c. contains 200 million Staphylococcus albus (canine); 200 million Staphylococcus aureus (canine); and 100 million Streptococcus (canine). In 10 c.c. rubber-diaphragm-stoppered bottles (Bio. 820). First dose, 0·5 c.c. ; second dose, 1 c.c. ; third dose, 1·5 c.c. ; fourth dose, 2 c.c. ; fifth dose, 2·5 c.c. ; sixth dose, 3 c.c. Inject subcutaneously at intervals of 3 or 4 days. This bacterin is made from micro-organisms isolated from secondary infections in cases of follicular mange in dogs. It is used in the treatment of follicular mange, interdigital abscesses, and other pyogenic infections in dogs.

Indications for Use.—The Staphylococcus albus is always found in the pus from follicular mange ; also in that from sarcoptic mange,

eczema, furunculosis, interdigital abscess, canker of the ear and other external affections, as a secondary invader, and it is frequently associated with Staphylococcus aureus and Streptococcus pyogenes. In all of these conditions energetic treatment with this bacterin is indicated. Mange no doubt originates with parasites which penetrate through the orifices of the hair follicles and into the regional sebaceous glands, setting up dilatation, irritation and inflammation, and favouring the invasion of staphylococci and streptococci. The very disappointing results of the treatment hitherto adopted for these diseases are largely due to the want of effectively antagonising the invading organisms. Bacterin treatment will meet this want, but parasiticide and local antiseptic treatment must also be employed.

Treatment should be commenced as early as possible. The bacterin should be administered hypodermically with due aseptic precautions; the lower abdomen, being practically hairless, is a good site for the injection. Other forms of treatment adapted to the attaining of local antisepsis and cleanliness must not be neglected; pus pockets and sinuses must be opened and drained, and all exposed infected surfaces frequently treated with germicides or parasiticides * as the case demands, for the purpose of exterminating the etiological factor of the primary affection.

Hamilton Kirk reports in the *Veterinary Record*, April 7, 1923, a case of **interdigital cyst** which entirely recovered after a course of this bacterin.

Mr. Stainton reported that he had obtained good results with this bacterin in cases of **acne** in the dog, also in **pustular follicular mange** (*Veterinary Record*, Jan. 26, 1924).

STREPTOCOCCUS-STAPHYLOCOCCUS BACTERIN (EQUINE).

Each c.c. contains 15,000 million Streptococcus equi (hæmolytic and non-hæmolytic); 500 million Staphylococcus albus (equine); and 500 million Staphylococcus aureus (equine). In 20 c.c. rubber-diaphragm stoppered bottles (Bio. 825), and in vials of 20 tablets equivalent to 0·5 c.c. of the fluid bacterin (Bio. 827).

This bacterin is employed as a preventive and curative agent for **equine influenza** (shipping fever or pink-eye) and its sequelæ or complications—**pneumonia, laryngitis** and **strangles**—in horses and mules. In well-established cases of equine influenza the primary infecting agent, Streptococcus equi, is almost invariably associated with the pus-forming micro-organisms Staphylococcus albus and aureus.

For **prophylaxis** three doses, respectively 1 c.c., 1·5 c.c. and 2·5 c.c. (or the solution of 2, 3 and 5 tablets), should be injected subcutaneously at intervals of three or four days; if the animal has been exposed to

* For this purpose Storaxol (*see page* 116) will be found excellent, or if a non-greasy preparation is preferred, a solution of Mercuric Iodide Tablets (*see page* 112) will be efficacious.

infection a dose of Anti-Influenza Serum (*see page* 6) should be given with each dose of bacterin. This course of prophylactic treatment is believed to protect a horse for 6 or perhaps 12 months. **At least three days** should elapse after the last dose of the series before the animal is exposed to possible infection.

In **treatment** the initial dose should be 0·5 c.c. and doses should be given at intervals of three or four days while necessary, increasing the amounts by 0·5 c.c. on each occasion; the administration of from 60 to 90 c.c. of Anti-Influenza Serum with each dose of bacterin is calculated to hasten recovery.

Streptococcus-Staphylococcus Bacterin is indicated in the treatment of **fistulous withers, poll-evil, quittor, cellulitis, lymphangitis, pyæmic arthritis** and **similar purulent infections.** Initial dose, 0·5 c.c. (or one tablet). Subsequent injections should be given at intervals of 3 or 4 days, each injection being increased from 0·5 to 1 c.c. (one to two tablets), as the condition of the patient may require.

This Bacterin is also used as a preventive of infection in cases of cuts, lacerations and similar injuries, for which purpose 0·5 c.c. should be injected as early as possible, the usual local treatment being also applied. The healing process appears to be much more rapid than when vaccine is not employed, and is characterised by an absence of pus formation.

The administration of Streptococcus-Staphylococcus Bacterin to in-foal mares is a valuable measure with a view to obviating the occurrence of **joint-ill in foals.** The treatment should be commenced a few months before the time of foaling, six doses being given in all, commencing with 0·5 c.c. and gradually increasing the amount, at five-day intervals.

Clinical Reports.

In a letter to the *Veterinary Record*, November 14, 1914, Mr. Leeney states that he has treated 102 cases of **irregular strangles** with Streptococcus and Staphylococcus Veterinary Hypodermic Tablets (P., D. & Co.) with excellent results.

In the *Veterinary Record*, July 31, 1915, Mr. Isherwood reports three cases of **strangles,** one of **purulent wound** and one of **abscess,** in all of which recovery was expedited by the use of Streptococcus-Staphylococcus tablets.

Mr. Payne reports in the *Veterinary Journal* (February, 1914) three cases of **mammitis** in dairy cattle treated with Streptococcus and Staphylococcus Vaccine, Combined (P., D. & Co.). Each cow received altogether four injections, commencing with 250 millions, and ending with 750 millions, with three days' interval between each dose. In each case there was a slight improvement after the second dose, the mammary secretion was more abundant, and the glandular substance was not so

resistant. A week after the last dose one animal was normal in every respect and the others showed marked improvement.

Veterinary Notes, London, for November, 1921, contained an abstract from the *Veterinary Record* in which Mr. Gregory described a severe case of **polyarthritis** in a foal over 4 months old. The umbilicus was quite dry and healthy. One c.c. of the bacterin, injected every three days, combined with the application of a stimulating liniment and massage of the swollen parts, proved surprisingly successful.

A veterinary surgeon in the North of England, in the belief that B. coli plays a part in most cases of **joint-ill,** injects a solution of 1 tablet of Colon Bacterin (Equine) (*see page* 19) and two tablets of Streptococcus-Staphylococcus Bacterin (Equine), and has found the treatment very successful.

Mr. Shiply attributes good results in cases of **granular vaginitis** in cattle to the use of this vaccine (*Veterinary Record,* Nov. 22, 1924).

It has been reported in the *Journal of the American Veterinary Medical Association* that three doses (0·3 c.c., 0·5 c.c. and 0·7 c.c.) of this bacterin at intervals of five days have given good results in the treatment of **piroplasmosis (Texas fever, hæmoglobinuria** or **red-water** in cattle).

CANINE DISTEMPER IMMUNOGEN (COMBINED).

A bacterial antigen, obtained from the ectoplasm of the cell wall, and practically free from bacterial cells and toxin. It represents antigens obtained from B. bronchisepticus, staphylococcus albus, streptococci (hæmolytic) and B. coli. In 10 c.c. rubber-diaphragm stoppered vials.

In announcing to the veterinary profession that Canine Distemper Immunogen (Combined) is available for use, Parke, Davis & Company make no far-reaching claim for the preparation. It is believed that the Immunogen represents an advance in antigenic therapy and is indicated as a prophylactic and curative agent in all forms of canine distemper due to the B. bronchisepticus.

A suggested scale of dosage for a dog weighing 20 lb. is as follows :—

	Prophylactic.	*Curative.*
1st dose	1·0 c.c. ..	0·25 c.c.
2nd ,, ...	1·5 c.c. ..	0·5 c.c.
3rd ,, ...	2·5 c.c. ..	1·0 c.c.
4th ,, ...	— ..	1·5 c.c.

For larger or smaller animals the dose must be increased or decreased accordingly. Injections may be made at intervals of three or five days.

Dogs undergoing prophylactic treatment against distemper should not be exposed to infection until at least ten days have elapsed after the last injection. When used as a curative agent treatment should be started as early in the course of the disease as possible. In no case should the appropriate medicinal, dietetic and hygienic treatment be neglected.

VETERINARY VACCINES.

ACTINOMYCOSIS VACCINE.

Prepared from killed cultures of the organism derived from cases of actinomycosis. The mycelial threads of which such cultures are composed can readily be broken up into small fragments resembling bacilli, and the vaccine standardised by enumeration of the fragments. Each c.c. of this vaccine contains 100 million mycelial fragments.

(This vaccine is prepared in the Laboratory of the Inoculation Department, St. Mary's Hospital, London.)

The specific disease known as actinomycosis or ray-fungus disease is due to infection by a vegetable parasite—the actinomyces or ray-fungus. It is chiefly met with in cattle, though it may also attack horses, pigs, sheep or dogs, and it is communicable to man. It is believed that the infection often arises from the consumption of cereal foods contaminated with the parasite, which gains access to the blood stream through wounds of the buccal mucosa, but the organism may also enter the system through abrasions of the skin.

The usual manifestation of the disease is the formation of new fibrous tissue in the neighbourhood of the portal of infection, frequently with small abscesses in the substance of the growth. This may occur in various parts of the body, but perhaps is most frequent in the mouth or tongue, giving rise to a condition popularly styled "lumpy jaw" or "wooden tongue."

In the treatment of the disease reliance is often placed upon the administration of potassium iodide (*see page* 86), biniodide of mercury, or other iodine compound, with surgical measures if called for, but the results are not always satisfactory. Vaccine treatment is well deserving of trial; it obviates the undesirable bye-effects of iodine medication, and, at least in some cases reported, appears to be more promptly remedial. If purulent complications are present, injections of Streptococcus-Staphylococcus Bacterin (*see page* 21) or of Mixed Infection Phylacogen (*see page* 31) should be given in addition to the vaccine.

ANTHRAX VACCINE (ANTHRAXOIDS),

for immunizing Cattle, Horses and Mules.

Every species of domestic animal is subject to anthrax, one of the most fatal of all livestock diseases; cattle and sheep in particular, horses and mules in a smaller degree, and swine to a still less extent.

Anthraxoids, which are designed to enable the veterinarian to combat the disease, are small pellets containing anthrax spore vaccine, each Anthraxoid being a dose. In the "double" variety, No. 1 dose and No. 2 dose are administered on two occasions, this method, where practicable, being considered preferable to the use of the "single"

anthraxoid which contains a full immunising dose. To vaccinate an animal inject one Anthraxoid under the skin by means of the animal vaccine injector.

Anthraxoids are supplied in two forms;—

Anthraxoids, single, for cattle, horses and mules, in vials each containing 10 doses (Bio. 840).

Anthraxoids, double, in packages of 1 vial of No. 1 (first dose) and 1 vial of No. 2 (second dose) sufficient for 10 animals (Bio. 840).

The Anthraxoid is rapidly absorbed after insertion beneath the skin, and greatly increases the animal's power of resisting disease. The best place for injection is just in front of the shoulder. Particular care must be taken to have the injector thoroughly sterilized. If an animal just vaccinated is suspected of being infected with anthrax the injector should be boiled in water for twenty minutes before it is again used.

If the animals have been associated with actual cases of anthrax and therefore may be presumed to be harbouring the disease in the incubation stage it is inadvisable to give vaccine alone. Ten c.c. of Anti-Anthrax Serum (*see page* 5) should first be injected on one side of the neck, and then a No. 2 Anthraxoid on the other side. The serum confers a degree of passive immunity until such time as the full effect of the Anthraxoid is developed and also guards against an excessive reaction to the vaccine. Should any animal show a high temperature the injection of the Anthraxoid should be postponed until normal temperature is regained under serum treatment.

BLACKLEGOIDS FOR CATTLE.

"Single" Blacklegoids for cattle are supplied in vials, containing 10 doses (Bio. 881); also in vials containing 5 doses.
"Double" Blacklegoids for cattle are supplied in packages containing 1 vial of No. 1 (first dose) and 1 vial of No. 2 (second dose) (Bio. 871) sufficient for 10 double vaccinations.

Blacklegoids for Cattle are small pellets each containing an accurate dose of vaccine prepared from the infiltrated tissues of an animal which has died from blackleg. The effect of inoculation with Blacklegoids is to increase the disease-resisting powers of the animal so as to render it immune to an attack of blackleg. Before the Blacklegoids are allowed to leave the laboratories each lot is tested on guinea-pigs to determine its activity, and on healthy cattle, in doses much larger than used for protective purposes, in order to prove its safety.

The Etiology of Blackleg.—The disease known as blackleg, black-quarter, quarter-evil, or symptomatic anthrax, is caused by the *B. gangrenæ emphysematosæ*, the incubation period of which is usually from one to three days; in exceptional cases it is somewhat longer, though seldom, if ever, more than five days. Ordinarily the disease is fatal in from twelve to forty-eight hours after the first manifestation of the

symptoms, but occasionally it may last from four to ten days. It has been reported that prompt treatment with Hydrogen Peroxide Solution prevented a fatal issue in a few cases (*see page* 111).

Immunization.—It has been proved that blackleg can be prevented by inoculating cattle with Blacklegoids. A well-known veterinary surgeon in the Midlands writes us under date February 19, 1920, to the following effect: "I have had very satisfactory results from the use of Blacklegoids. In one herd of sixty yearlings I left one animal unvaccinated as a control, and it died two months later from blackleg. Not one of the others was affected—a truly singular case that speaks for itself."

Immunity is not established for about ten days after inoculation with Blacklegoids, and if infection is present at the time of the operation no result can, of course, be expected. Moreover, if the animal is in poor condition it may not possess sufficient disease-resisting powers, and in such a case immunity cannot be expected. Many stockmen, in infected areas, make a practice of having all young cattle inoculated every three months.

Calves become susceptible to blackleg as soon as they begin to eat forage; occasionally the disease will show itself in calves not more than a month old, therefore vaccination should be carried out as soon as the calves begin to forage for themselves and at least three months before the arrival of the blackleg season.

The protection conferred by inoculation with Blacklegoids does not persist indefinitely. If calves under three months of age are inoculated the operation should be repeated in the course of two or three months. Animals six months old should be re-vaccinated at the end of half a year, and those twelve months old at the end of a year. Cattle above two-and-a-half years of age rarely require inoculation, especially if this was done at an earlier age.

Blacklegoids for Cattle are made in two different strengths—Double Blacklegoids, in which the prophylactic dose is administered in two parts, the second being injected ten or twelve days after the first has been given. The best authorities agree that the divided dose is the most effective means of conferring immunity against blackleg, and the double Blacklegoids are especially recommended for use on pedigree stock and stock in poor condition. Single Blacklegoids, which contain the immunizing material in a single dose, are usually employed when a large number of cattle have to be inoculated and the double process is scarcely practicable.

Mode of Administration.—Blacklegoids are introduced beneath the skin of the animal by means of the animal vaccine injector (*see page* 99), under thoroughly aseptic conditions. The best site for the injection is the neck just in front of the shoulder.

It is hardly practicable to sterilize the injector after each vaccination; ordinarily it will be sufficient if, after five or six vaccinations,

the injector is dipped in a 5% aqueous solution of carbolic acid. If, however, there is reason to believe that an animal just vaccinated has blackleg, the injector should be boiled for twenty minutes before being again used.

When to Inoculate.—Cattle should be vaccinated when they are in good condition, and the best time is in the spring or autumn. Vaccination is a tax upon the animal, and should not be done at the same time as de-horning, castrating, or any such operation. After being vaccinated the cattle should not be exposed to wet or cold, or to changes in temperature, nor should they be allowed to enter infected pastures for at least twelve days after inoculation, as during that period they are specially susceptible to infection.

Concerning Doses.—One Blacklegoid of the single variety forms one dose, no matter what the age of the animal. If better protection is desired, the double variety should be administered in doses given ten of twelve days apart. As a rule all animals, whether young or old, tolerate the same dose. Occasionally, for various reasons, vaccination may fail to protect. We cannot, in any circumstances, recognise claims in respect of such occasional failure, or in respect of unfavourable results following vaccination.

It has come to our knowledge that some persons have given the No. 1 Blacklegoid to one animal and the No. 2 to another, but we should point out that this is dangerous. The No. 2 Blacklegoids should on no account be given to an animal that has not had the No. 1 dose twelve days previously. Blacklegoids retain their efficacy for two years, but when once the vial is opened the Blacklegoids should be used immediately, or within twenty-four hours at latest.

BLACKLEG AGGRESSIN (*Blackleg Germ-free Vaccine*).

The exudate from infected tissues of calves which have succumbed to blackleg. The tissue juices are subjected to several processes for the purpose of removing all traces of organisms, and the product is subjected to careful tests for the determination of sterility and immunizing properties. It is supplied in bulbs containing 50 c.c. (Bio. 882).

Blackleg Aggressin is employed for the prophylactic treatment of cattle against blackleg. It is impossible to produce the disease by the use of the vaccine, as no blackleg organisms or spores are present in the aggressin, and therefore the product can be used with perfect safety and without danger of producing blackleg in highly susceptible animals. The dose is 5 c.c. for each calf, to be injected hypodermically at the side of the neck, with due aseptic precautions at least three weeks before the blackleg season arrives. Inoculated calves should not be turned into infected pastures for at least two weeks after the treatment.

Calves should be vaccinated as soon as they begin to eat forage. Those under three months of age when first vaccinated should be revaccinated when about six months old. A single vaccination will probably be sufficient to protect calves over three months old.

BLACKLEG FILTRATE (*Blackleg Germ-free Vaccine*).

Prepared from pure cultures of B. gangrenæ emphysematosæ (blackleg bacillus), the organisms being carefully removed by filtration. Supplied in bulbs containing 50 c.c. (Bio. 876).

This preparation contains the soluble antigenic substances formed by the growth of the bacteria, and is not toxic. Each batch is carefully tested to ensure sterility and immunizing power. For the prophylactic treatment of cattle against blackleg 5 c.c. should be injected subcutaneously at least three weeks before the blackleg season arrives. From three to ten days are required for the development of immunity, during which time it is desirable to protect the animals from exposure. Usually one inoculation will protect the animal throughout the susceptible period, but calves that were less than three months old at the time of inoculation should be revaccinated when six months old.

HÆMORRHAGIC SEPTICÆMIA.

CATTLE—SHEEP—SWINE.

Practically all animals, both wild and domesticated, are susceptible to hæmorrhagic septicæmia, and the disease manifests itself in various forms, peracute, acute, subacute and chronic, according to the virulence of the infection or the susceptibility of the animals attacked. There are also pulmonary, intestinal, cutaneous, and meningeal forms of the disease, according to the symptoms shown.

The veterinarian is particularly interested in this disease as it occurs in cattle, sheep and swine. The disease in these animals is known by various names in different localities, or according to its clinical aspect.

Thus, in *Cattle* it is known as Hæmorrhagic septicæmia, Stock-yards pneumonia, Pasteurellosis bovum, Septic pleuro-pneumonia, or Corn-stalk disease ; in *Sheep* it is termed Hæmorrhagic septicæmia, Infectious pneumo-enteritis, Pasteurellosis ovum, or Catarrhal fever of sheep ; and in *Swine* it is referred to as Hæmorrhagic septicæmia, Swine plague, or Pasteurellosis suum.

Nature of the Disease.

Cattle.

Bovine hæmorrhagic septicæmia may appear in different forms, as follows :—

1. *Acute septicæmic form.*—Deaths occur suddenly, without symptoms being noted. Characteristic lesions consist of petechial hæmorrhage on serous and mucous membranes. So-called " corn-stalk " disease.

2. *Pulmonary (pectoral) form.*—Most frequently seen in young cattle recently shipped from a public stock-yard. Characterised by catarrhal pneumonia. So-called " stock-yards pneumonia."

3. *Intestinal form.*—Subacute or chronic course, characterised by bloody discharges from the bowels.

4. *Meningeal (nervous) form.*—Symptoms usually acute, and nervous in character.

5. *Cutaneous form.*—Œdema of the subcutaneous tissues, especially of the throat and dewlap. Skin over swollen parts may be very sensitive, tense and hot. So-called " mad itch " is believed to be a form of the disease.

Sheep.

Ovine hæmorrhagic septicæmia has not been reported in so great a variety of forms as hæmorrhagic septicæmia in cattle, although there is no reason why the disease in sheep should differ, in any essential detail, from the disease in cattle.

1. *Acute septicæmic form.*—Sometimes seen in conjunction with the same form of the disease in cattle.

2. *Pulmonary (pectoral) form.*—Analogous to " stock-yards pneumonia " of cattle. Seen in lambs shipped for feeding purposes.

3. *Intestinal form.*—Marked by bloody diarrhœa with very fœtid odour. More often seen in sheep than in other animals.

Swine.

1. *Acute septicæmic form.*—Death sudden. Autopsy shows petechial hæmorrhages only. May be confused with hog cholera.

2. *Pulmonary form.*—So-called swine plague. May occur independently of true virus cholera, or as a complication. Autopsy shows various forms of pneumonia.

Biological Therapeutics.

Much work has been done with the hæmorrhagic septicæmia organisms, with a view to developing a satisfactory method of immunization against the disease. As a result of the work of many investigators, we now have two distinct biological products to offer veterinarians for prophylactic and therapeutic treatment :—

1. *Bacterin.*—A suspension of killed hæmorrhagic septicæmia organisms, 10,000 millions per cubic centimetre.

Supplied in vials containing 20 c.c. (Bio 785) or 100 c.c. (Bio. 786).

2. *Vaccine.*—A suspension of attenuated, living hæmorrhagic septicæmia organisms, 5,000 millions per cubic centimetre.

These remedies are polyvalent and are employed for cattle, sheep and swine alike.

Prophylactic Treatment.

There are a number of well-known conditions in which it is advisable to immunize against hæmorrhagic septicæmia :—

1. On premises or in localities where the disease makes its appearance at certain times each year. Under such conditions the double treatment with bacterin and vaccine is indicated. All susceptible animals should be vaccinated : First with an immunizing dose of bacterin, followed ten days later by an immunizing dose of vaccine.

2. Under similar conditions to those mentioned above, when it is either inconvenient or impossible to round up the animals for the double vaccination, a single dose of immunizing bacterin is indicated. It should be remembered, however, that the double vaccination induces a higher degree of immunity and should always be used when possible.

3. When the disease appears among a herd, the animals affected should be quarantined and all the remaining apparently healthy animals should receive a prophylactic dose of bacterin.

Prophylactic dosage.

	Bacterin.	*Vaccine.*
Cattle	4 c.c.	4 c.c.
Sheep	2–4 c.c.	2–4 c.c.
Swine	2–4 c.c.	2–4 c.c.

Curative Treatment.

For animals already affected with the disease bacterin in suitable doses may be employed. Vaccine should not be used for the treatment of affected animals.

Curative dosage.

	Bacterin.
Cattle	4 c.c.
Sheep	2–4 c.c.
Swine	2–4 c.c.

Packages.

Hæmorrhagic Septicæmia Bacterin.

A suspension of killed hæmorrhagic septicæmia organisms. Each c.c. represents 10,000 million bacteria.

Vials containing 20 *c.c.* (*Bio.* 785).

Vials containing 100 *c.c.* (*Bio.* 786).

Hæmorrhagic Septicæmia Vaccine.

Combined prophylactic treatment, consisting of 1 vial of Bacterin (killed organisms) and 1 vial of Vaccine (attenuated living organisms), each suspension containing 5,000 million bacteria per 1 c.c.

Packages containing 20 *c.c. of Bacterin and* 20 *c.c. of Vaccine* (*Bio.* 790).

Packages containing 100 *c.c. of Bacterin and* 100 *c.c. of Vaccine* (*Bio.* 791).

VETERINARY PHYLACOGENS.

Phylacogens are solutions of bacterial proteins modified by autodigestion, prepared by Parke, Davis & Co. for use in the treatment of infectious diseases. They contain no bacteria, but antigenic substances which are capable of stimulating the body cells to produce protective "antibodies."

Administration.—The Phylacogens may be administered either subcutaneously or intravenously, with careful aseptic precautions. When given subcutaneously, the site of the injection should be changed with each dose, to avoid producing too much induration.

When introduced intravenously, the Phylacogen must be injected very slowly, not less than three, preferably five minutes being occupied in the process. The intravenous method produces more prompt therapeutic effect, but the systemic reaction is much more marked than in the case of subcutaneous injections. The reaction is exhibited in chill and rigor, increased peristalsis, staring coat, etc., but is seldom of a severe character.

Dosage.—The dose (whether subcutaneous or intravenous) is the same for each Phylacogen, viz., 10 c.c. for a horse. This amount may be increased if necessary up to 30 c.c. A dose should be given every twelve hours, or more frequently (if indicated) in cases of acute infection, until all symptoms have subsided. Not less than six injections should be given, even if the symptoms disappear before that number has been reached, as cases in which only three or four injections have been given may relapse. The dose for colts is from 5 to 10 c.c., and for other animals in the usual proportion.

MIXED INFECTION PHYLACOGEN, EQUINE (P., D. & Co.).

This preparation is a sterile aqueous solution of bacterial derivatives prepared by cultivating a number of strains of pyogenic Staphylococci and Streptococci, *Bacillus coli communis*, and *Bacillus pyocyaneus* of equine origin, the bacteria being subsequently killed, a preservative added and the metabolic products separated by passing the fluid through a porcelain filter. Supplied in vials containing 30 c.c. (Bio. 960).

Therapeutic Indications.—The administration of Mixed Infection Phylacogen, Equine, is indicated in the treatment of **strangles, abscesses, quittors, fistula of the withers, poll-evil, pyæmic arthritis, scirrhous cord, septicæmia, eczema, metritis, laminitis, azoturia, purpura hæmorrhagica, wound infections,**

and all suppurative conditions. The usual treatment of evacuating pus-cavities, irrigating pus-sinuses with antiseptic solutions, removal of necrotic tissues, etc., should not be neglected. The modes of administration and the dosage are described on page 31.

Clinical Reports.

The use of Mixed Infection Phylacogen, Equine, as a prophylactic and curative in **strangles** is reported in the *Veterinary Record* for September 6, 1913. The author had to deal with a secondary outbreak occurring a few weeks after the first had apparently cleared up. One horse, affected with sub-maxillary and post-pharyngeal abscesses, and four others with temperatures ranging up to 104° F., were given injections of 30 c.c. of Mixed Injection Phylacogen, Equine, and all the other horses on the farm were given 15 c.c. as a preventive. The result was highly satisfactory. The horse (aged) with the abscesses commenced feeding the next day, and made an uninterrupted recovery in ten days. The horses with temperatures soon became normal, and were at work in three days, and no more fresh cases occurred.

Mr. Dyson reported in the *Veterinary News* of January 1, 1916, a case of **septicæmia** in an eight-year-old mare. A tense, painful swelling along the back was lanced, liberating a little foul-smelling gas followed by a fœtid sanious fluid. The wound was irrigated antiseptically. On the fourth day, thinking the case was hopeless, Mr. Dyson thought he would experiment with Mixed Infection Phylacogen, of which he injected 30 c.c. The wound was suppurating freely and the edges standing out prominently. Exploration showed that the muscle on both sides of the wound was separating from the surrounding parts. On the next day 30 c.c. of Phylacogen were injected and 15 c.c. on each of the next eleven days. Two lumps of dead muscle, respectively 2 and 3½ pounds in weight, were extracted from the wound, after which a large amount of vile-smelling pus came away. The discharge gradually diminished, and full recovery followed.

A case of **poll-evil** treated with Mixed Infection Phylacogen, Equine, is reported in the *Veterinary Record* for November 15, 1913. The swelling over the region of the poll extended about 12 inches from before backwards, and about 18 inches laterally, with fistulæ discharging a most offensive sanguino-purulent fluid. The sinuses were syringed out with hydrogen peroxide solution, and Mixed Infection Phylacogen, Equine, was injected. This treatment was continued at intervals for a month, with continued improvement in the patient. Three weeks later the horse was put to work, and has shown no signs of relapse. The author states that he considers this an extraordinary cure, as he thought any treatment would be useless; he is convinced that the time of treatment could have been reduced to one half, or less, if it had been possible to dress the wound and inject the Phylacogen daily, or even every other day.

A veterinary surgeon reports that in cases of **quittors** his percentages of cures in heavy draught horses are over 90, only one horse in ten failing to respond to the treatment, which is as follows :—

Sinuses are opened, cleansed with Hydrogen Peroxide (P., D. & Co.), and irrigated daily with a 10% solution of copper sulphate. Mixed Infection Phylacogen, 30 c.c., is injected subcutanously every other day for one week. Usually this quantity is sufficient, but some cases require a few more doses.

As a precaution against the occurrence of **joint-ill in foals** it has been recommended that the mare should be given an injection of 10 c.c. of Mixed Infection Phylacogen about a fortnight before the expected date of foaling and 20 c.c. two days after the 10 c.c., also that the foal should have an injection of 5 c.c. as soon after birth as possible, with 10 c.c. and 15 c.c., respectively, on the two following days.

In the *Veterinary Record* of January 9, 1915, Mr. Levie reports the case of a Shire mare suffering from **septic metritis** complicated with parturient laminitis, which recovered after two 15 c.c. doses of Mixed Infection Phylacogen had been given on successive days, followed by three daily injections of Adrenalin (P., D. & Co.). The author considers that the Phylacogen cut short the course of the disease, while the Adrenalin removed the cause in the structures of the feet.

Mr. Mundy reports in *Veterinary Notes* for June, 1915, a case of **purpura hæmorrhagica** in a three-year-old mare which was successfully treated with daily doses of Mixed Infection Phylacogen, also of 5% Nuclein Solution (P., D. & Co.). The dose of each remedy was 10 c.c., the Phylacogen being given on eight occasions and the Nuclein on ten. On the fourth day of treatment the swelling commenced to diminish, and by the eighth day it had disappeared—the speediest recovery the author had ever observed, and the credit for this he gives to the Phylacogen.

Mr. Van de Grift reports in the *American Journal of Veterinary Medicine* for August, 1918, that five young pigs of his contracted **hog cholera** (**swine fever**), and after one of them had died, he gave 10 c.c. of Mixed Infection Phylacogen to each of the others. On the next day all four took their food satisfactorily, and were soon all right again. Being subsequently called to a farm where there were 37 sows suffering from the fever, Mr. Van de Grift suggested to the owner that Mixed Infection Phylacogen should be tried. Five sows died before treatment could be given, but the remaining 32 were each given 10 c.c. hypodermically. One animal died about half an hour after the injection, but all the others made a good recovery.

A report on the use of Mixed Infection Phylacogen in **canine practice,** which appeared in *Veterinary Notes* for June, 1914, includes the description of a case of **septicæmia** following a wound of the foot in a fox terrier whose leg had swollen to three times the natural size. The temperature stood at 106° F. and the surgeon was on the point of

poisoning the dog as a hopeless case, when it occurred to him to try Phylacogen. The dog was given 2 c.c. of Mixed Infection Phylacogen subcutaneously, followed by 2 c.c. in six hours, and 3 c.c. in twelve hours time. Three hours after the third dose, the temperature was almost normal. The swelling disappeared rapidly, the wound healed well under ordinary dressing, and the dog made a perfect recovery.

PNEUMONIA PHYLACOGEN, EQUINE (P., D. & Co.).

This preparation is a sterile aqueous solution of bacterial derivatives prepared from cultures of *Diplococcus pneumoniæ* combined with those of the pyogenic Staphylococcus and Streptococcus, *Bacillus coli communis* and *Bacillus pyocyaneus* of equine origin. Numerous strains of each organism are employed, the bacteria are subsequently killed, a preservative added, and the solution of metabolic products separated by passing through a porcelain filter. Supplied in vials containing 30 c.c. (Bio. 950).

The constitution of Pneumonia Phylacogen, Equine (P., D. & Co.), is based upon the theory that whilst in pneumonia the objective and subjective symptoms point to a preponderance in the patient of the toxic products of the *Diplococcus pneumoniæ*, complicating organisms are always present in great variety and number, and their influence must also be counteracted.

Therapeutic Indications.—The administration of Pneumonia Phylacogen, Equine, is indicated in the treatment of all cases of **pneumonia and its complications.** Successful results depend upon a *correct diagnosis* of pneumonia, either as a primary or secondary condition. The modes of administration and dosage are described on page **31.**

Clinical Reports.

A prominent veterinary surgeon in Yorkshire furnishes the following notes on a case of **pneumonia** in a valuable Shire horse, rising five years. Temperature 106°, respiration 60, pulse 100. No appetite. Viscid discharge of rusty colour from both nostrils. Consolidation on both right and left side. Prognosis extremely grave. 30 c.c. of Pneumonia Phylacogen injected subcutaneously, also solution of digitalis, sparteine and strychnine. On next day 10 c.c. of the Phylacogen given intravenously on three occasions. On both morning and evening of day following, 20 c.c. of Phylacogen given intravenously, also 10 c.c. of Adrenalin Chloride Solution in a litre of normal saline. Four litres of blood withdrawn, and seven litres of normal saline infused. Temperature now 105°, pulse 75, respiration 40. Signs of returning appetite. On each of next three days, 15 c.c. of the Phylacogen given subcutaneously night and morning. The digitalis, etc., was also given night and morning throughout the week. The horse made an excellent recovery. (*Veterinary Notes*, London, August, 1916.)

A veterinary surgeon in Ireland writing on May 29, 1924, states: "Pneumonia Phylacogen has given the most wonderful results of

anything I have ever used in the treatment of **pneumonia** with complications. The patient was a valuable six-year-old thoroughbred hunter, that had failed to benefit under the usual treatment for four weeks, the temperature being never below 105° F. Emaciation and weakness were extreme and the case was pronounced hopeless by a consultant. At this stage it was decided to try Pneumonia Phylacogen. 15 c.c. were injected intravenously at 3 p.m. and at 7 p.m. This brought the temperature down two degrees. At midnight 15 c.c. were given intravenously and thereafter the same quantity was given subcutaneously twice daily. After the eighth dose the temperature was normal and the horse soon made a perfect recovery.

VETERINARY DIAGNOSTIC AGENTS.

MALLEIN (P., D. & Co.).

A product of the bacillus of glanders, or farcy, containing the toxic substance resulting from the growth of the bacillus. When introduced subcutaneously, or placed in the conjunctival sac, mallein causes a reaction in animals infected with the disease, even before there is any outward manifestation. It is supplied in solution for subcutaneous administration, ready for use without diluting, and also in discs convenient for ocular application. **For packages, see page 36.**

Rationale of the Mallein Test for Glanders.—The specific mallein reaction depends upon the fact that infection with glanders produces a peculiar condition of the animal body which manifests itself by an increased susceptibility to the toxins of the organism which produce the diseases. For diagnostic purposes this hyper-sensitiveness is made use of by administering the mallein to suspected animals, and a positive or negative reaction is considered to indicate the presence or absence of infection.

The mallein test may be applied in several ways, the most important of which are the subcutaneous test (the thermic reaction) and the ophthalmic test (the conjunctival reaction).

The Subcutaneous Test.—Mallein Solution (P., D. & Co.) is supplied in vials containing the appropriate quantity for one test (Bio. 913), with directions for its application. After the solution has been injected, a horse which is infected with glanders will react by a persistent swelling at the point of injection, and by a rise of temperature with general fever symptoms, whereas in non-glandered animals there is little, if any, swelling, little increase of temperature, and no sign of malaise.

The Ophthalmic Test.—This test is most conveniently applied by means of the " P., D. & Co." Mallein Ophthalmic Discs, each of which contains an accurate diagnostic dose of carefully desiccated Mallein.

The method of application is extremely simple. A lower eyelid is gently everted, and a disc is placed thereon near the inner canthus. This procedure is less likely to frighten the animal than is the application of the solution by means of the eye dropper or brush, and after the disc is introduced, there is an assurance that the Mallein is all present in the exact amount necessary. The disc dissolves *in situ* within a minute, and its presence does not appear to cause any discomfort. It produces no sign of irritation and no inflammatory reaction in the eye of a normal or a non-susceptible animal.

The specific conjunctival reaction should begin from five to seven hours after the application of a disc, and usually remains visible for from six to thirty-six hours. It consists in more or less lachrymation and the formation of pus; the manifestation varies somewhat in different animals, and is not considered positive unless pus appears.

Dr. Mohler, of the U.S.A. Department of Agriculture (see *Veterinary Record*, May 2, 1914), states that after extensive investigation he considers that the ophthalmic test will offer the most accurate means for diagnosis of glanders in general practice, being more reliable and simpler in its application than the subcutaneous test, and offering less chance for error in its interpretation. Moreover, the agglutination test may be applied to the serum of an animal after an ophthalmic test (if required), whereas a previous subcutaneous injection of Mallein interferes with agglutination.

PACKAGES.

MALLEIN (Subcutaneous). 2 c.c. bulbs sufficient for one test, ready diluted (Bio. 913).

MALLEIN OPHTHALMIC DISCS (Bio. 905) are supplied in vials of five discs; they remain potent for an indefinite period, and they are much more economical in use than is the Mallein Solution.

TUBERCULIN FOR VETERINARY DIAGNOSIS (P., D. & Co.).

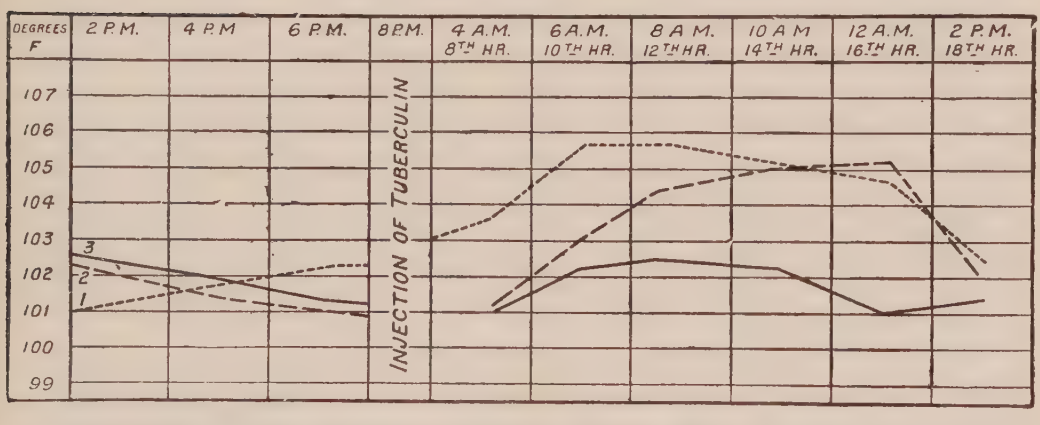
A preparation of the water-soluble toxins of the tubercle bacillus according to the original formula of Prof. Koch, and diluted so that 4 c.c. contain 0·5 gramme of Koch's Old Tuberculin, for the diagnosis of obscure tuberculous processes in cattle. It is sterile and free from bacteria, therefore it cannot give rise to tuberculosis. **For packages, see page 40.**

Nature of the Test.—If an animal is healthy, the subcutaneous injection of Tuberculin will not cause a perceptible rise in temperature, but if tuberculous disease is present (except in an advanced stage) such an injection causes temporary pyrexia. An injection of properly prepared Tuberculin cannot implant the disease, nor can it have any permanent effect upon the quality of the animal's milk.

The Subcutaneous Test.—The subcutaneous Tuberculin test appears to be perfectly satisfactory when carried out under conditions which permit of scientific control. Careful note must be taken of the animal's temperature six, four and two hours before the test is made. The usual method is to inject the Tuberculin subcutaneously, behind the shoulder, using the dose indicated by the weight of the animal. It is of the utmost importance that the syringe and needle, also the site of injection, should first be carefully sterilised. During the test the animal should be protected from extremes of heat or cold, and should be fed and watered as usual. It is not advisable to test an animal whose temperature is above normal, nor during the period of heat.

Dose.—The following graduated dosage is recommended for cattle of the weights indicated:

Animals up to	400	pounds,	2	c.c.	(32 minims).
,, 400 to	600	,,	2.5	,,	(40 ,,).
,, 600 to	800	,,	3	,,	(48 ,,).
,, 800 to	1,100	,,	4	,,	(64 ,,).
,, 1,100 to	1,400	,,	5	,,	(80 ,,).
,, 1,400 to	1,700	,,	6	,,	(96 ,,).
,, over	1,700	,,	7	,,	(112 ,,).



Character of the Reaction.—Eight hours after the injection, and every two hours subsequently (for a period of at least twelve hours), the animal's temperature must be noted. A rise of 2° F. above the highest temperature recorded prior to the injection is indicative of tuberculosis.

The California Agricultural Exper. Station Bulletin states that if the temperature after an injection rises above 102·5° F. it is well to take hourly readings. In hot weather, the injection should be so timed that the eighth to sixteenth hours afterwards shall fall in the cool of the day.

The above chart is typical; it illustrates the temperature curves of three animals injected with Tuberculin.

According to Marshall, the point at which the reaction is considered positive is a relative quantity. A temperature that rises gradually from the eighth to the sixteenth hours from 102° to 104° or above, under ordinary conditions may be considered a positive reaction. When the rise is close to 2° F. and the temperature not above 104° at any time, the reaction is classed as doubtful. A positive tuberculin reaction generally shows a regular rise, the temperature remaining at the highest point for only a short time, then falling gradually to the normal. The decline is usually more rapid than the rise, although exceptions occur. The character of the curve should also be taken into consideration. A widely fluctuating temperature, say a high, then low, and later a high temperature, is not a characteristic curve, and should be classed as doubtful rather than as a positive reaction.

It is of the highest importance to be perfectly sure of the quality of the Tuberculin, also of the accuracy of the thermometer. There are other factors, also, which may lead to an erroneous diagnosis, such as the animal being over-tired when tested, and therefore failing to react, or the lesions may be of so extensive a character that no reaction will take place, or the disease may be present only in the incubation stage. Again, a reaction may take place from the presence of old lesions which have healed. The administration of febrifuge medicines, also draughts of very cold water, may modify the body temperature and suggest a negative diagnosis, or the climax of the reaction may be so transient as to be missed in two-hour readings. It has also been known that the owner of a tuberculous animal has injected Tuberculin surreptitiously prior to a veterinarian's certificate being sought ; such an injection may render unreliable any test made within the next thirty days.

Re-testing.—A single test of a diseased herd cannot be depended upon to detect every tuberculous animal. "Neglect of this in the past," says Sir John McFadyean, "has probably been more responsible than anything else for disappointment and partial failure in attempts to eradicate the disease."

All exposed animals should be re-tested at intervals of from six to twelve months. A re-test within a month is unreliable, as time must be given for the Tuberculin of the first test to be eliminated from the system. When animals are re-tested within six months, use a double dose of Tuberculin.

Owing to the uncertain results from some preparations, the value of the test has been called in question. "P., D. & Co." Tuberculin is absolutely trustworthy.

Samples of every lot of Tuberculin sent out from the laboratory are subjected to a double test, to insure reliability. The first test is performed in the laboratory, on tuberculous guinea-pigs—the test employed by the Bureau of Animal Industry in determining the strength of commercial tuberculins. The second test is performed in the field, under actual conditions, on tuberculous cows.

The Ophthalmic Test. Tuberculin Discs.—About three days before the test insert an ophthalmic disc into the conjunctival sac at the inner canthus of the eye. When the test proper is made, insert a second disc into the same eye as before. A positive reaction usually makes its appearance about six hours after the application of the second dose of Tuberculin. First there is lachrymation, then reddening of the conjunctiva and an œdematous swelling about the eye. A few hours later the conjunctival secretion becomes purulent. The pus may flow over the lower lid and drop off, or remain as a sticky mass which later dries and forms a crust.

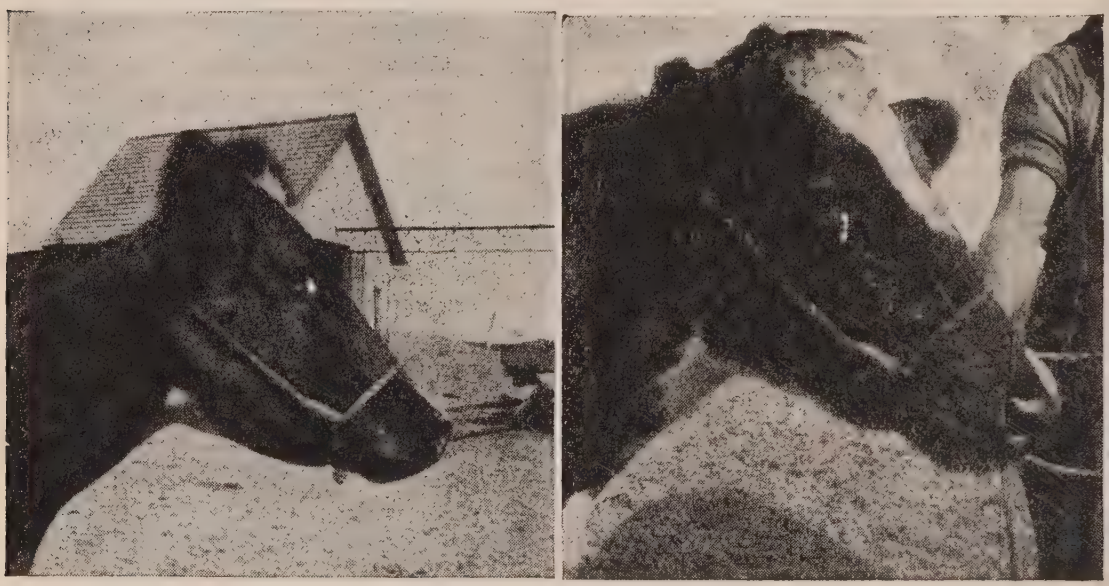
The Intradermic Test.—Yet another method is that known as the intradermic test, with which it is claimed neither age, condition of the animal, pregnancy nor excitement interferes appreciably, and no night watching is required. In carrying out this test, the needle of the syringe should be inserted into the deeper layer of the skin, but not through it into the subcutaneous tissue. For directions *vide infra.* In a tuberculous animal a swelling results ; it varies in extent, but is sufficiently marked, it is hard and painful, and persists for from five to ten days.

The Committee appointed by the Medical Research Council to investigate the use of Tuberculin for the diagnosis of tuberculosis in cattle, recommended the use of the intradermal test supplemented by the ophthalmic test. In their official report, emphasis is placed on the accuracy of this test, the percentage of error being extremely small. Its advantages over the subcutaneous test are, that no temperature observations are required, the animal need not be kept at rest, and no interference with ordinary farm routine is necessary. Moreover, a smaller quantity of Tuberculin is required, and, as a rule, only three observations are necessary. The technique, although at first slightly more difficult than that of the subcutaneous injection, is easily acquired.

The following directions are taken from the Medical Research Council's report:—

The centre of the side of the neck is regarded as the most suitable site for the injections. An area of from two to six square inches is shaved with a sharp razor on the day before performing the test. A fold of skin in the shaved area is held firmly between the thumb and forefinger of the left hand. A strong, short, steel needle is inserted obliquely into the fold so that the point is from 2 to 3 mm. below the epidermis (some breeds of cows whose skin is very thick require the injections to be given at a deeper level). A small all-glass syringe containing the Tuberculin is attached to the needle and a drop of the liquid forced into the substance of the derma—this may require the application of considerable pressure to the plunger. If the injection has been correctly made, a small pea-like swelling situated in the thickness of the skin is immediately evident. A second dose of Tuber-

culin must be given from forty-eight to seventy-two hours after the first or sensitising dose in precisely the same manner, the needle being inserted so that the point lies in about the centre of the swelling caused by the first injection. One drop of Tuberculin (old) is sufficient in each case—the dose should not exceed 0·1 c.c.



OPHTHALMIC TEST.

MODERATE REACTION WELL-MARKED REACTION.

Packages.

Tuberculin (Veterinary) (Subcutaneous), in 20 c.c. vial with rubber diaphragm, diluted ready for use, sufficient for 5 average doses (Bio. 924); 100 c.c. vial, sufficient for 25 average doses (Bio. 925).

Tuberculin (Veterinary) (Intradermic). 1 c.c. bulb containing 5 doses (Bio. 927); 5 c.c. bulb containing 25 doses (Bio. 928).

Tuberculin (Veterinary) Ophthalmic Discs. Vial containing 10 discs (Bio. 923).

Note.

There is an impression amongst British stock breeders that all cattle destined for Canada and Argentina must be tested with a certain commercial brand of Tuberculin before shipment from British ports. This impression is absolutely erroneous, and there is no objection to the use of P., D. & Co's. Tuberculin for the testing of such cattle. Moreover, all cattle imported into Canada and Argentina are tested with Tuberculin before leaving the quarantine stations whether or not they have been tested before shipment from the country of origin. If, however, British breeders wish, for their own satisfaction, to have their cattle tested, P., D. & Co.'s Tuberculin may be used with perfect confidence.

GLAND THERAPY IN VETERINARY PRACTICE.

INTRODUCTION.

The importance attached to ductless gland therapy in the human subject naturally lends support to the suggestion that glandular remedies may be used in animal medicine. Save as regards Adrenalin and Pituitrin such use is still very limited, but there is the probability that thyroid and even parathyroid therapy may become of considerable interest to the veterinary surgeon.

Preparations of the ductless glands derived from cattle, sheep, or other animals, are employed in the treatment of diseases due to destructive changes in the glands themselves, a form of treatment which is known as " substitution therapy," the object being to replace the absent or deficient secretion of the gland involved. The administration of carefully selected and prepared glandular products is also likely to prove beneficial where there is relative insufficiency owing to over-action of some opposing gland.

Occasionally, when a gland is developing an amount of secretion in excess of the system's requirements, its activity may be controlled by the administration of some other glandular preparation. There are also cases where the well-known physiological action of the active principles of various glands may be useful, quite apart from any defect in the patient's own glands, as illustrated by the use of Adrenalin and Pituitrin. Lastly, a large number of conditions exist in which glandular products have been found beneficial, notwithstanding that no connection has been established between the disease and the gland function. Such medication may be classed as " empirical treatment."

In the following pages, brief particulars are given of some preparations of the internal secretions offered by Parke, Davis & Co., with full assurance of their identity and quality.

THYROID GLAND, DESICCATED (P., D. & Co.).

The thyroid glands from animals used for human food, carefully dissected, freed from fat and desiccated. One grain of the powder corresponds to 5 grains of fresh thyroid gland.

(*See also* Thyroid Tablets, *page* 87).

Hoare (*System of Veterinary Medicine*, Vol. II., page 1306) states that a disease has been observed in dogs similar to cretinism in those regions where this condition is endemic in the human subject. The symptoms are a moderate enlargement of the thyroid gland, anomalies in the growth of the bony system and the soft parts, and also in the

development of the brain. The spinal column is compact and reduced in length, the skull large and short, the extremities short and clumsy, and the neck thick and shorter than normal. Digestive troubles, apathy, and a sleepy appearance are present. Similar symptoms have followed complete extirpation of the thyroid in the dog. Treatment with dry thyroid gland has produced similar results in the dog to those which have been found to follow its use in cretinism and myxœdema in man.

Mr. Roberts (*Veterinary Journal*) reports the following case :— A fox terrier had two **swellings** on the upper part of the neck which interfered with his breathing. The dog was of a very nervous nature and an operation was not deemed advisable. Internal administration of thyroid gland was suggested, and one tablet of fresh thyroid was given every evening for 300 consecutive days. After this long treatment, the glands were found quite normal, the respiration was natural, there was no more cardiac impulse, and on stethoscopic examination the heart was found to function regularly.

The *Veterinary News*, December 4, 1920, states that Thyroid Extract gives very good results in many cases of **chronic nasal catarrh** with apathy in aged dogs ; also in **chronic papular eczema** in the emasculated cat.

Mr. Velder states that he has had good results from thyroid gland administration in cases of **distemper.** (*Veterinary Record*, March 1, 1924.)

Mr. Pugh states that thyroid administration has proved useful in the endocrine upset following the persistence of the corpus luteum and the consequent prevention of those uterine contractions at the œstrum which help to eliminate retained discharges or infective material. (*British Medical Journal*, April 11, 1925.)

A Chicago veterinary surgeon states that thyroid administration is most useful for reducing **obesity** in aged dogs ; at the same time it has a decided invigorating effect.

F. A. E. Crew reports that thyroid administration rejuvenates aged fowls. (*Veterinary Journal*, August, 1925.)

A veterinary surgeon informs us that he finds Thyroid Gland Tablets invaluable in the treatment of **interdigital cysts** in dogs.

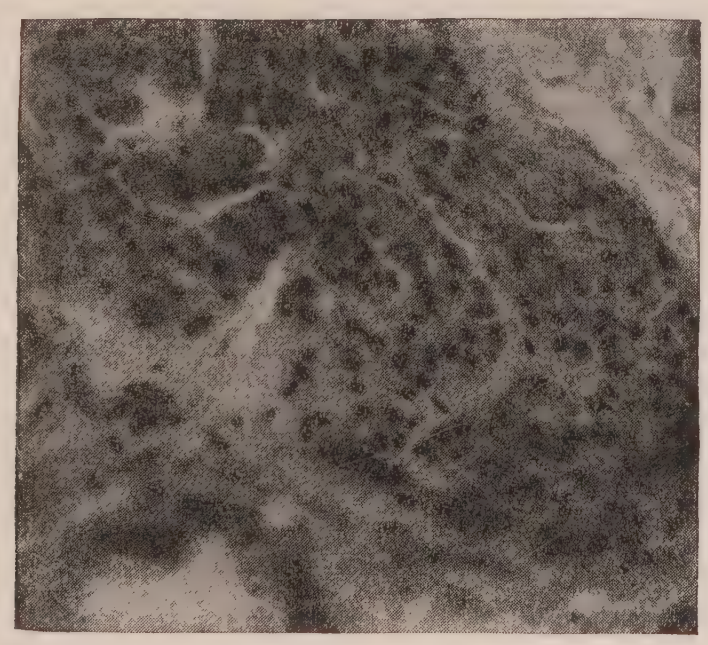
PARATHYROID GLAND, DESICCATED.

Tablets each containing 1/10 grain or 1/20 grain are available. Parathyroid and Calcium Tablets contain 1/40 grain of the desiccated gland together with 5 grains of calcium lactate.

The parathyroid glands are usually four in number, and are small oval or spherical bodies, in most cases of a distinctly lighter colour than thyroid tissue, in which they are frequently embedded. Their anatomical distribution varies in different animals and in different individuals.

Of the theories advanced in explanation of the physiological functions of these glands, the two most important are (1) that they provide a detoxicating agent to destroy the poisonous guanidine which results from imperfect metabolism of proteins and which might otherwise accumulate in the muscles, and (2) that they control the calcium content of the blood and indirectly act as a sedative and regulator of nerve impulses, and also possibly as the deciding factor in regulating the acid-base equilibrium of the blood.

It has been shown that complete removal of the parathyroid is followed by convulsions, which usually end fatally. Partial removal ultimately produces a condition of tetany—muscular spasm and convulsions—which, however, may sometimes be controlled by ad-



TRUE PARATHYROID TISSUE (× 300)

ministration of the gland substance. Parathyroid gland has therefore been suggested for the treatment of **chorea** in dogs and cats. Tutt (*Veterinary Record*, April 12, 1924) records two cases which presumably responded to this treatment.

The possibility of a derangement of the internal secretions, particularly of the parathyroid, has been put forward tentatively by Dryerre and Greig in explanation of the cause of **milk fever.** If their assumption that the animal is suffering primarily from a parathyroid deficiency is correct, the administration of the gland substance would appear to be worthy of trial in the treatment of this condition.

An illustration of the remarkable possibilities of parathyroid in veterinary practice is furnished by a report of the case of about forty wire-haired terriers of various ages suffering from **rickets** and **osteo-**

malacia. They were given one five-grain capsule of Metagen (*see page* 69) twice a day with food and 1/10 grain of desiccated parathyroid daily for the first week ; during the second week the parathyroid was given every second day, and during the third week at intervals of three days. Throughout the treatment careful attention was paid to diet and housing, and, except in cases where the bones were malformed, every animal made a good recovery.

Speaking at a meeting of the Yorkshire division of the National Veterinary Medical Association, Mr. J. Clarkson is reported to have stated that, in cases of **rickets** and malnutrition amongst puppies, which had come under his observation, parathyroid had acted like a charm. (*Veterinary Record*, April 18, 1925.)

ADRENALIN CHLORIDE SOLUTION, 1 : 1000 (P., D. & Co.).

This preparation consists of 1 part of Adrenalin Chloride in 1,000 parts of physiological Sodium Chloride Solution containing 5 parts of Chloretone. It may be sterilised by boiling without detriment to its action, but as this drives off the Chloretone which is the preservative agent, the boiled solution should not be returned to the original bottle.

If it be required to dilute the solution, sterilised distilled water may be used, or, preferably, a solution of one Compressed Tablet Sodium Chloride (P., D. & Co., No. 365) in four ounces of cold, recently-boiled distilled water.

Adrenalin is the constringent, cardiac-stimulant and blood-pressure raising principle of the suprarenal gland. It was isolated by Dr. Takamine in the year 1900, was introduced into medicine by Parke, Davis & Co., in January, 1901, and was admitted into the 1914 edition of the British Pharmacopœia.

The thousands of clinical reports which established the therapeutic value of the suprarenal principle related solely to the use of Parke, Davis & Co.'s Adrenalin.

IMPORTANT.—At the request of the General Medical Council, Parke, Davis & Co. have given permission for the use of the word " Adrenalin " in the 1914 edition of the British Pharmacopœia. The official Liquor Adrenalini Hydrochloricus, however, differs somewhat from the Adrenalin Chloride Solution, 1 : 1000, which Parke, Davis & Co. have always supplied. Most veterinary surgeons will naturally prefer to use the original and well-tried " P., D. & Co." preparation, and now that there is an official preparation, it is more than ever necessary, in order to ensure reliable results, when prescribing or ordering the suprarenal principle, to specify distinctly : " Solution of Adrenalin Chloride, Parke, Davis & Co."

Adrenalin, P., D. & Co., is the natural product extracted from the suprarenal glands of oxen.

Note on Incompatibility.—Adrenalin is a sensitive body, susceptible to injury by many chemical agents, and it should not be mixed indiscriminately with other substances. While certain mixtures are

chemically rational and therapeutically useful, it is generally best to administer Adrenalin without admixture.

If stored in tightly-stoppered, full bottles, in a cool, dark place, Adrenalin Chloride Solution retains its activity for a long time. Contact with air, fumes of ammonia, formaldehyde and other gases is injurious to it.

Physiological Action of Adrenalin.—Adrenalin is the most powerful **hæmostatic and constringent** known. Applied to the larynx or pharynx in inflammatory conditions, to the nasal mucous membrane in **coryza,** to the eye in **conjunctivitis, iritis,** etc., the action of Adrenalin is prompt and effective. It reduces congestion, and either prevents or checks capillary bleeding. Injected into the uterus in cases of **postpartum hæmorrhage,** it contracts the uterine vessels and arrests hæmorrhage by constriction of the muscular walls. Sprayed into the nasal cavities, Adrenalin is effective in arresting **epistaxis.** In all cases of **wounds** and **hæmorrhage** the solution should, whenever possible, be applied directly to the source of bleeding.*

When applied to mucous membrane, also when injected subcutaneously, Adrenalin produces **ischæmia** ; this property renders it invaluable for reducing or obviating bleeding in surgical operations. Moreover, it has been found that the **diffusion and absorption of cocaine, eucaine,** and other analgesic drugs is greatly restricted by a preliminary application of Adrenalin Chloride Solution to the part to be anæsthetised, or the two solutions may be applied (or injected) simultaneously. In this way the action of cocaine is localised, and a smaller quantity will suffice for efficient analgesia than would be required if Adrenalin were not used. Also, Adrenalin antagonises the depressant effect of cocaine, and thus tends to prevent unpleasant sequelæ to the use of that drug. These important considerations have led to the preparation of combinations of Adrenalin with various analgesic drugs [*e.g.*, Codrenine (solution of cocaine with adrenalin), Cocaine with Adrenalin Tablets, Apothesine Solution, etc.] for use in surgical operations, in order to obviate pain and bleeding—particulars of these will be found elsewhere (*see page* 120).

Adrenalin is given intravenously, hypodermically, or orally as a **heart stimulant and vaso-constrictor.** In **purpura hæmorrhagica,** the intravenous injection of repeated doses of Adrenalin, well diluted, raises the general blood-pressure and diminishes extravasation.

Dosage.—The customary **oral doses** of Adrenalin Chloride Solution are : for cattle, 1 to 2 fl. drachms ; horses, 30 to 60 minims ; sheep, 10 to 30 minims ; pigs, 5 to 20 minims ; dogs, 5 to 10 minims ; cats, 1 to 2 minims.

* In some conditions in which it is desired to apply the constringent and hæmostatic action of Adrenalin topically, one of the following preparations will be more convenient than the Solution :—Adrenalin Ointment (with or without Chloretone) for application to mucous surfaces (*see page* 101) ; Adrenalin Suppositories for rectal inflammation, hæmorrhoids, etc., in dogs or small animals (*see page* 53).

References to some Clinical Reports.

In the discussion which followed a paper read by Mr. Davies on "Traumatic Maladies of the Foot of the Horse," Prof. Wooldridge said that in cases of **laminitis** he injected as much as 40 minims of Adrenalin Solution (1 : 1000) diluted with the same amount, or twice that amount, of normal saline solution. By means of this injection over each plantar artery the throbbing was reduced, also the excessive congestion of the sensitive lamina. By reducing the congestion, the danger of extravasation from the vessels, which causes separation, was diminished, and the prospect of the descent of the pedal bone, which followed the separation, reduced. (*Veterinary Record*, February 21, 1914, page 547.)

Professor J. McCunn, M.R.C.V.S., in a paper reported in the *Veterinary Record*, May 28, 1927, states that in the early or congestive stage of laminitis good results can be obtained if Adrenalin is injected over the course of the plantar vessels. He considers that in the early stages laminitis is simply an acute congestion of the vascular structures contained in the foot and the object of the Adrenalin is to diminish the volume of blood flowing into the foot and thus to diminish pain arising from the pressure of an excessive amount of blood in this non-distensible structure.

It has been his practice to give an injection of 5 c.c. of a 1 : 1000 solution of Adrenalin over the plantar vessels just above the fetlock, 2½ c.c. on each side.

In the discussion which followed this paper, Professor Smythe stated that he has used this method for several years, generally in conjunction with a local anæsthetic and that probably Quinine and Urea is the best agent for this purpose, as its effects are prolonged and it is said to be effective for 24 to 48 hours.

In the *Veterinary Record*, August 16, 1919, Mr. Nixon reports that he has been successful in several cases of **hæmoglobinuria** in horses which he treated with Adrenalin Chloride Solution orally. He gives doses of 30 minims for ponies and 60 minims for big horses—together with stimulants and salines and also the application of a stimulating liniment to the loins.

Mr. Masheter records a case of **hæmoglobinuria** in a ten-year-old horse in which he injected 2 drachms of Adrenalin Chloride Solution intramuscularly on two successive days; aloes and digitalis were administered orally. A week later the horse returned to light work. (*Veterinary Record*, August 4, 1923.)

In the *Veterinary Record*, March 21, 1925, Mr. Gardner states that he has had excellent results in cases of parturient **laminitis** from the subcutaneous injection of 1 c.c. of 1 in 1000 Adrenalin Chloride Solution over the internal and external digital arteries at the level of the fetlock joint—repeating in twenty-four hours if necessary.

Mr. Gardner says: "I can with confidence recommend in cases

of **azoturia**, 2 drachms of Adrenalin Chloride Solution injected deeply into the muscles of the back twice daily, having first given 1 grain of arecoline hydrobromide." (*Veterinary Record*, March 21, 1925, page 232.)

With the above treatment, Elixir Saw Palmetto and Santal Co., 2 ounces in 12 ounces of water, 3 times daily, produced specific results and aided rapid and complete recovery.

W. C. Miller, M.R.C.V.S., reports a case in the *Veterinary Record*, February 13, 1926, of a fifteen-year-old gelding in which he diagnosed unilateral azoturia; treatment consisted of the hypodermic injection of Adrenalin Chloride Solution (1 : 1000) in doses of one drachm at intervals of eight hours, combined with the application of hot salt packs and the internal administration of potassium nitrate, common salt and calomel in capsule; recovery was slow but uneventful.

In the *Veterinary Record*, January 5, 1924, Mr. Chambers reports a case of **hæmophilia** in a dog which led to intractable bleeding on two occasions; first from a small ulcer, and, two years later, from an ulcerated growth. On each occasion slow bleeding had been going on for two weeks or more, but was at last arrested by a hypodermic injection of Adrenalin Chloride Solution.

Mr. Maguire, writing in the *Veterinary Record* of July 10, 1915, records the "remarkable effect of Adrenalin Chloride Solution which was the only medicine used" in an attack of **hæmoptysis** in a five-year-old harness mare that had been troubled with cough for some time. Whilst being driven, the blood commenced to come from the mare's mouth, and when Mr. Maguire saw her an hour later, all round where she stood was covered with clotted blood, and he thought the case was hopeless. He injected 2 drachms of Adrenalin Chloride Solution, hypodermically. The cough, which previous to the injection had occurred every half-minute, became less frequent, and within twenty minutes both bleeding and cough ceased and did not recur. Mr. Maguire states: "The mare is now in perfect health and I am certain that but for Adrenalin she could not have lived more than a few hours."

Mr. Levie reports in the *Veterinary Record* of January 9, 1915, the case of a mare with **septic metritis** complicated with **parturient laminitis** in which after adopting suitable local treatment he gave Mixed Infection Phylacogen on two successive days, and on the third, fourth and fifth days injected solution of Adrenalin hypodermically. On the sixth day the mare could lie down or get up, and could move about with ease. On the ninth day recovery was complete.

In a discussion on **bovine piroplasmosis** (see *Veterinary Record*, November 26, 1921, page 943), two speakers reported good results from the injection of Adrenalin Chloride Solution.

In cases of **laryngitis** Mr. Kellett recommends spraying the throat with Adrenalin Solution. (*Veterinary Record*, November 30, 1912, page 328.)

Mr. E. Wallis Hoare, writing in the *Veterinary Record*, August 9, 1913 (page 90), on the treatment and prevention of **parturient paresis (milk fever)**, states that in cases that are slow to get up, or in those where a second or third inflation of the udder fails to accomplish the desired effect, he has found that the hypodermic injection of Adrenalin Solution (1 in 1000) in doses of from 2 to 4 drachms, according to the size of the cow, proves very successful.

A case diagnosed as **chronic hæmorrhagic nephritis** was reported in the *Veterinary Record* for March 26, 1910, the subject of which, a six-year-old cow, had for some months voided urine of a dark blood-red colour which, on standing, threw down a copious dark-red slimy deposit, in which the microscope showed an enormous number of red blood corpuscles, the supernatant fluid being almost normal in tint. Half a drachm of Adrenalin Chloride Solution diluted with 5 drachms of distilled water was injected into the neck, and urine voided four hours subsequently was only rose-red in tint, that of ten hours later was quite normal, and this has continued to be the case ever since.

Mr. Thompson, writing in the *Veterinary Record* of September 30, 1916, reports a case of violent **straining after parturition** in a heifer. Twelve drachms of chloral hydrate were given in solution, orally, the os uteri was smeared with extract of belladonna, and a laxative drench was given. The patient appeared to be easier for a while, but in 30 hours she again commenced to strain violently. With an ordinary hypodermic syringe, 1 fl. drachm of Adrenalin Chloride Solution was injected into the walls of the neck of the womb, one injection on each side of the os uteri. Within ten minutes the cow appeared to be quite comfortable and within half an hour was on her feet, eating hay. Three cases of **eversion of the rectum** in young horses, Mr. Thompson treated by injecting Adrenalin Chloride Solution into the walls of the bowel before replacing it; the results were very gratifying. **Everted vagina** and **os uteri** of in-lamb ewes has been very successfully overcome in a similar manner. Mr. Thompson says: "The effect of Adrenalin Chloride in such cases is marvellous."

Mr. R. Hudson, F.R.C.V.S., writing in the *Veterinary Journal*, April, 1926, on the treatment of **hæmorrhage following parturition**, states: "Adrenalin and stimulants are good in all cases. The action of Adrenalin is sometimes wonderful."

For controlling **hæmorrhage in bovine coccidiosis**, Mr. Smythe, M.R.C.V.S., recommends hypodermic injections of Adrenalin Solution. "This drug," he states, "is a powerful astringent and hæmostatic, and can be employed very advantageously in a great variety of inflammatory conditions, as well as in internal and external hæmorrhages."

A paper by Mr. A. Spicer, F.R.C.V.S., in the *Veterinary Record* of May 30, 1925, describes a treatment for tuberculosis in cattle, that has given some interesting results. With the object of localising the effect of the Tuberculin the author conceived the idea of administering

a mixture of Tuberculin and Adrenalin, and as a result of observations of numerous cases of tuberculous cattle, claims that the treatment has proved decidedly valuable as a palliative. The Adrenalin employed was the P., D. & Co. Solution.

The writer puts forward the suggestion that Adrenalin and Tuberculin combine to form some substance at present unknown, which has a marked effect in controlling clinical cases of tuberculosis.

The October, 1926, issue of the *Veterinary Journal* reviews an account of the use of Adrenalin in different maladies, contributed to the *Revue Vétérinaire* for March, 1926, by Potekin, a Russian doctor of veterinary medicine.

1. **Pharyngitis.**—Pharyngitis in the horse has been successfully treated by subcutaneous injections of Adrenalin Chloride Solution 1 : 1000. On the day following the injection of 3 c.c. of the solution, horses which previously could not drink at all because the fluid flowed back through the nostrils have generally been able to take a bucketful of water without difficulty. By repeating the injection daily, complete recovery has been obtained at the end of five days, whilst ordinary treatment occupies from two weeks to a month to effect recovery.

2. **Acute Bronchitis.**—Acute bronchitis in cows has been similarly cured by subcutaneous injections of 3 c.c. of Adrenalin Chloride Solution 1 : 1000. Prior to the injection, food and drink were refused and dyspnœa was extreme. The animals trembled all over and could not lie down, and crepitant rales were evident on both sides. A dose of Adrenalin brought relief from the dyspnœa at the end of 1½ hours.

3. **Domestic Birds.**—With the spring and autumn lung troubles usually appear in birds, and it is not uncommon to find the whole flock to be victims of this infectious malady. The subjects refuse all nourishment, have great dyspnœa and hold the beak constantly open. In this ailment Solution of Adrenalin has proved very useful. Two injections of 10 to 15 drops may be given, according to the size of the bird, together with the local application of tincture of iodine, the administration of aspirin, etc.

4. **Sucking-pig Plague.**—During the spring and summer in Russia pigs are frequently affected with plague, and become thin, listless, without appetite and with the characteristic eruptions on the skin and ear. An injection of Adrenalin twice daily for two days has produced the best results, and in many cases after the second injection, accompanied by the administration of sulphate of iron and potassium permanganate internally, and by suitable feeding, the animal recovers.

A cat which had been fed on raw pig's flesh became apparently infested with the chronic pest of the pig, and was treated with 10 drops of Adrenalin Chloride Solution repeated daily for three days, and subsequently with Anti-Distemper Serum (P., D. & Co.), and ultimately recovered.

Other conditions in which Adrenalin has produced excellent results in the opinion of this veterinary surgeon are **pleurisy** of the calf, and **post-partum paralysis,** in which the usual treatment by insufflation of warm air into the udder is combined with the subcutaneous injection of Adrenalin and of Caffeine and Camphorated Oil.

ORCHIC SUBSTANCE, DESICCATED.

Tablets containing 5 grains (0·325 gms.) of desiccated orchic substance (also known as testicular substance) equivalent to 35 grains (2·26 gms.) of the fresh gland.

Orchic Substance has been reported to be useful as an aphrodisiac ; in combination with anterior pituitary and suprarenal gland, it is said to be particularly effective in the case of stud hounds, but it appears to be necessary to continue the administration of this combination for at least three weeks.

In the *Veterinary Journal*, January, 1922, Tutt reported that the administration of four 5-grain tablets of Orchic Substance daily to a Pomeranian bitch had produced œstrus, whereas previously the administration of corpus luteum had not been successful.

OVARIAN SUBSTANCE.

Tablets each containing 1 grain and 5 grains of the desiccated whole ovarian substance (equivalent to 6 grains and 30 grains respectively of fresh entire ovary).
For hypodermic use, Soluble Extract of Ovarian Substance is supplied in " Glaseptic " ampoules containing 1 c.c.

The combination of interstitial ovarian tissue and corpora lutea present in Ovarian Substance supplies the active principle of the ovary in the proportions and balance present when the gland is at the height of its functioning power.

CORPORA LUTEA.

Capsules each containing 5 grains of desiccated corpora lutea equivalent to 25 grains of fresh gland.
Tablets each containing 2 grains of desiccated corpora lutea equivalent to 10 grains of fresh substance.
For hypodermic use, " Glaseptic " ampoules each containing 1 c.c. of soluble extract of corpora lutea.

The administration of corpora lutea would appear, on theoretical grounds, to offer a rational method of treating sterility when this is not due to structural abnormality, and in human medicine very satisfactory results have been reported from its use in this condition and also in habitual abortion.

PITUITRIN (P., D. & Co.).

A solution containing the active principles of the posterior lobe of the pituitary gland. An invaluable oxytocic ; uterine, cardiac and vesical tonic. The activity of Pituitrin is determined by physiological tests.

Physiological Action.—Pituitrin is a powerful stimulant of the muscular fibres of the uterus, and is extensively employed in veterinary obstetrics. It has given remarkably good results in **uterine inertia** in the bitch (which animal is probably the one most frequently affected with difficult labour), also in cats and sows. It appears to act equally well upon either an originally inert uterus or one which has become inert only after severe but ineffective labour pains. One or two injections bring about regular vigorous contractions resembling normal labour pains. The duration of labour is greatly reduced, and the necessity for manual or instrumental interferences often obviated by its administration.

Messrs. Lescohier and Closson state that the nearer the pregnant animal is to term the more marked are the uterine contractions produced by the injection of pituitary extract. They find that it is practically non-toxic in doses far larger than are required for therapeutic effect. A dose of 5 c.c. per kilo of body-weight, given experimentally to a small bitch, produced nothing worse than a slight temporary manifestation of uneasiness, and some urinary and fæcal activity ; except for a mild glycosuria which persisted for three weeks the animal appeared to be quite normal after the first day or two. (*Journ. of the Michigan State Med. Soc.*, October, 1912.)

The average oxytocic dose for mares is from 5 to 10 c.c., for sows and ewes 3 c.c., to be injected intramuscularly ; this may be repeated two or three times at hourly intervals if necessary. For dogs and cats a single intramuscular injection of 3 to 5 minims is usually sufficient ; in some cases, however, two, or even three, doses may be required. Before injecting the drug it is necessary to empty the bowel and bladder, thus removing mechanical obstruction.

Pituitrin has a stimulating effect on the arterial system, it increases the force of the heart-beat and lowers the pulse-rate ; the rise in blood pressure which follows its administration is much more enduring than that produced by Adrenalin. This property renders the drug of great use in cases of **shock and collapse** following severe injuries or major operations. (See article by Mr. Peddie in the *Veterinary Journal* for November, 1912.)

Pituitrin exerts a stimulating influence upon the muscular coats of the bladder, relieves **vesical atony** and augments the secretion of urine ; it has a similar effect upon the muscular fibres of the intestinal tract, and induces peristaltic contractions in atonic conditions.

The powerful constricting action of Pituitrin upon small blood-

vessels renders it of great value in controlling **intestinal, pulmonary and other forms of hæmorrhage.**

The effect of Pituitrin on the milk-producing function is to cause the udder to empty more quickly, although the total quantity of milk is said not to be affected. (Pugh, *British Medical Journal*, April 11, 1925.)

Clinical Reports.

In an article which appeared in the *Veterinary Journal* for December, 1912, Mr. Livesey states that as a result of two years' experience with Pituitrin he considers it to be a safe and valuable assistant in cases of **delayed parturition** or where pain has ceased. Mr. Livesey has given as much as 3 c.c. in a day to a bitch, without any apparent ill effect. He finds that its action is evident about 10 to 20 minutes after an injection, and it continues usually for 1½ hours. In no instance did the womb become tetanised, even after a 2 c.c. dose, and in no case did a pup die during delivery. Mr. Livesey also reports that **post-partum hæmorrhage in a bitch** was stopped **by a single** injection (0·5 c.c.) of Pituitrin.

Mr. Peddie, writing in the *Veterinary Journal* for November, 1912, reports that he has found infundibular extract of great value in **uterine inertia.** The dose he gave was 1 c.c. to full-size bitches, *injected intramuscularly.* Even small animals, such as Scotch terriers and Yorkshire terriers, tolerated doses of 0·5 c.c.

Writing in **the** *Veterinary Record* of April 5, 1924, Mr. Tutt states **that when, in the ewe**, after rupture of the fœtal membranes the labour pains cease and the os uteri closes, the intramuscular injection of Pituitrin has been attended with very gratifying results. The initial dose should be 2 c.c. injected either into the gluteal muscles or the vasti muscles of one of the hind limbs. Further injections of 1 c.c. are given every 15 to 30 minutes according to the case.

Mr. Mayall states that Pituitrin certainly does waken up weak labour pains in the bitch. To Pekinese and Airedale bitches he gave 0·5 c.c. (*Veterinary Journal*, August, 1922.)

A writer in **the** *Veterinary Journal*, October, 1926, states:

"Pituitrin is often of the greatest value in **prolonged parturition** or **uterine inertia** in the sow. A pedigree sow which had been in labour for 36 hours was found with one pig, and as nothing further happened on the following day, I was called in. I could not locate a fœtus, although it was evident from appearances that there were several present. I gave the sow 3 c.c. of Pituitrin and decided to leave her for a few hours. As I was about to leave the sow was in labour again, and in less than one hour from the time I injected the Pituitrin the sow had given birth to nine live pigs."

A veterinary surgeon informs us that he finds Pituitrin of great value for dogs and cats **as a recuperative after influenza and pneumonia.** He gives 0·5 c.c. each day after the worst stage of the attack has passed.

MEDICINAL PREPARATIONS,

including CAPSULES, FLUID-EXTRACTS, PILLS, TABLETS, etc., also OCULETS (Ophthalmic Discs) and RECTAL SUPPOSITORIES.

ADRENALIN SUPPOSITORIES (P., D. & Co.).

Each suppository contains 3/200 grain of Adrenalin (equivalent to 1 in 1000) in Oil of Theobroma base.

Adrenalin Suppositories are particularly serviceable in the treatment of **post-partum hæmorrhage, hæmorrhage of the vagina** and **piles** in dogs. The vaso-constrictive action of Adrenalin promptly reduces congestion, arrests bleeding and relieves pain.

ALOETIC PHYSIC BALLS (P., D. & Co.).

EACH BALL CONTAINS :

Barbados Aloes (purified)	6 drachms
Calomel	60 grains
Nux Vomica	60 grains

The very best drugs obtainable are used in the preparation of these balls, and are enclosed in a soluble gelatin capsule, which prevents deterioration. The ball is easily administered, particularly if it is first held under water for a few seconds until the gelatin surface becomes slippery.

ALOIN (P., D. & Co.).

The purified active principle of the finest Barbados aloes, being preferable to the latter on account of its definite activity and the convenience with which it may be administered (either with or without the addition of calomel) in the food. The dose is about one-third that of the best Barbados aloes, viz., for horses, 90 to 120 grains ; pigs, 20 to 60 grains ; dogs, 20 to 10 grains ; cats, 1 to 4 grains.

Pollock says that in cases of impaction in horses he gives 1 ounce of Aloin in a pint of warm water, followed by arecoline hypodermically. A solution of Aloin acts more quickly than a ball and does not appear to gripe. (*Veterinary Record*, November 28, 1914.)

BROMIDE AND CHLORAL COMPOUND ELIXIR (P., D. & Co.).

EACH FLUID OUNCE CONTAINS :

Potassium Bromide	120 grains
Chloral Hydrate	120 grains
Extract of Cannabis Indica	1 grain
Extract of Hyoscyamus	1 grain

Bromide and Chloral Compound Elixir is a valuable **nerve sedative** of more than ordinary power. Each ingredient is of assured strength, the extract of Indian hemp (a very variable drug) being standardised by physiological test. This elixir may advantageously be used in the nervous type of **distemper, in colic, chorea, eclampsia, fits, convulsive struggles of gastric impaction, gastritis, uræmia, etc.**; it is a valuable adjunct to the serum treatment of **tetanus**. A dose administered prior to operations on horses or dogs exerts a general quieting effect which is very helpful to the surgeon. The dose for a horse is from one to two fluid ounces, well diluted with water.

CAPSULES, CHLORETONE AND BELLADONNA COMPOUND.

EACH CAPSULE CONTAINS :

Chloretone	1½ grains
Potassium Bromide	2½ grains
Extract Belladonna	½ grain

These capsules are specially adapted for the treatment of so-called chorea and nervous affections in dogs.

Two veterinary surgeons who have submitted these capsules to trial report conspicuous success in quite 70 per cent. of cases.

A bull pup was having **fits** every hour, a capsule was given every three hours for twelve hours and the puppy has had no more fits—it is now two weeks since the treatment.

In another case a dog was having fits every few minutes—six capsules were sufficient to check these and now, after three months, the dog is free from this disorder.

After checking the fits with the capsules it is beneficial to put the animal on to Parathyroid Tablets and lime-water. The combination of capsules and parathyroid tablets has yielded quite excellent results.

Another veterinary surgeon, in the South of England reports :—

"A pedigree spaniel puppy, aged 11 months, developed **chronic spasms,** affecting the hind legs and the jaw, with marked paresis of the hind quarters, immediately following apparent recovery from distemper. One capsule was given three times daily, diet restricted to milky substances and fish in small quantity ; exercise and unnecessary excitement were avoided. After five days the twitching in the jaw stopped completely and that in the legs was better. The dosage was gradually reduced first to one capsule twice daily, and subsequently

one capsule was given at midday. One month from the commencement of the treatment the dog was quite cured.

"A West Highland White which developed chronic spasms of both fore and hind legs of the left side of the body and the ear was given parathyroid extract every third day. Half the contents of a capsule were also given twice daily—increasing this later to three times daily. As the number and severity of the twitchings diminished the dose was reduced to twice and then once daily. The twitching subsided completely first in the ear, then in the fore leg and finally in the hind leg."

A third report from an M.R.C.V.S. states :—

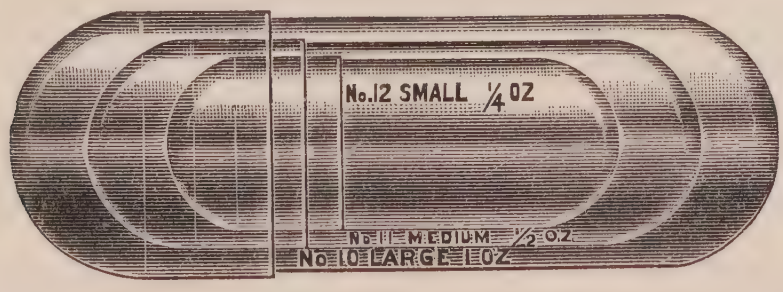
"These capsules are certainly the best I have used for **chorea** as they are longer and more sedative in their action, and there is not the vomiting frequently associated with potassium bromide alone."

(For other capsules, see under name of drug.)

CAPSULES, GELATIN, EMPTY (P., D. & Co.).

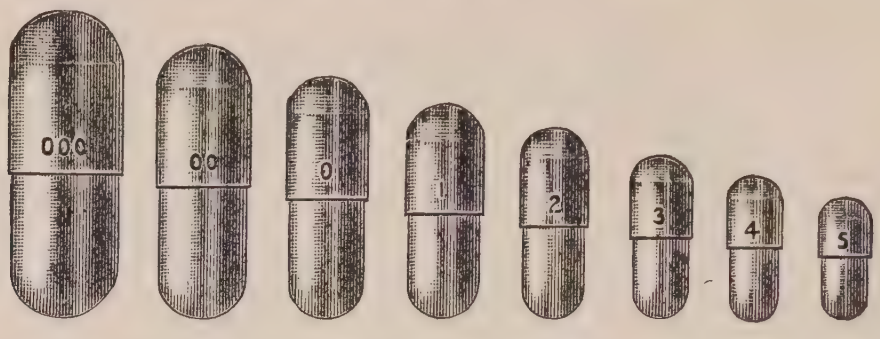
Attention is particularly invited to the solubility, pliability, and permanence of these capsules. They are made of the finest gelatin, and their caps fit perfectly.

The capsules are supplied in various sizes, Nos. 7, 10, 11, and 12 being specially adapted for veterinary purposes. A horse ball or electuary, or a dog bolus, when enclosed in one of these capsules is readily taken, as its taste is entirely concealed. An eminent veterinary surgeon tells us that he finds administration is facilitated by first holding the capsule under water for a few seconds till its surface becomes slippery.



No. 7, extra size (9 drachms)
No. 10, large (1 ounce)
No. 11, medium (½ ounce)
No. 12, small (¼ ounce)
} Supplied in boxes of 10 or 100 capsules.
No. 13, about 50 minims capacity, supplied in boxes of 100.

Smaller sizes, very useful for administering medicines in powder to dogs or cats, are supplied as follows :—



No. 000 (25 minims, holds about 20 grains of powdered rhubarb).
No. 00 (17 minims, holds about 12 grains of powdered rhubarb).
No. 0 (12 minims, holds about 8 grains of powdered rhubarb).
No. 1 (9 minims, holds about 6 grains of powdered rhubarb).
No. 2 (6 minims, holds about 4 grains of powdered rhubarb).
Nos. 3, 4 and 5, holding 3, 2 and 1 grain.

} Supplied in boxes of 100 or 1000.

CARBON TETRACHLORIDE (PURE) CAPSULES.

Carbon Tetrachloride—a definite chemical compound having the formula CCl_4—is supplied in soft gelatin capsules containing 1 c.c. (17 minims). It is guaranteed pure.

Carbon Tetrachloride has been recommended for the treatment of intestinal parasites in domestic animals—particularly of round worms and hookworms; it has no action on tapeworms, but appears to be particularly inimical to the mature liver fluke (Fasciola hepatica).

For the treatment of liver rot in sheep, Carbon Tetrachloride has been reported to be very effective.

An extensive trial of this remedy for fluke disease has been reported by R. F. Montgomerie, B.Sc., F.R.C.V.S., in the *Journal of Comparative Pathology and Therapeutics*, June, 1926, from which the particulars below are abstracted.

The administration of Carbon Tetrachloride to sheep infested with the liver fluke has been shown to kill all the mature flukes and to cause their expulsion from the liver. Immature flukes, however, are unaffected by the treatment, and it may be necessary, therefore, to redose sheep after an interval of four weeks. In acute cases, when the liver is heavily infested with immature flukes, drug treatment frequently fails to effect a cure as the sheep die before the flukes are sufficiently mature to be affected by the remedy.

As a prophylactic measure it is recommended that sheep should be dosed once a month in the period from October to April.

Dosage.—The dose recommended for sheep is 1 c.c., administered in the morning—preferably after the sheep have fasted overnight. The capsule may be administered by means of a balling gun or any device which avoids breaking the capsule in the mouth. Should the capsule be broken in the mouth no harm will result, but another should be given immediately.

The drug appears to be toxic to cattle, and should not be given to these animals until further tests have established a safe dose.

Doses fifty times as large as that recommended have been given to sheep without toxic symptoms supervening. On the other hand several fatalities among sheep have been reported from the administration of 1 c.c. doses of the pure drug, and this would suggest that some sheep may have a peculiar idiosyncrasy to the drug. In view of this fact, **veterinary surgeons are advised not to dose the whole of a flock until the drug has first been given to a few of the sheep to ascertain that it is well tolerated.**

Owing to its variable action and the possible presence of toxic compounds of sulphur, *commercial* Carbon Tetrachloride should not be administered therapeutically. For this reason veterinary surgeons should specify P., D. & Co., when ordering capsules of Carbon Tetrachloride, so as to ensure obtaining the pure drug.

CASCARA EVACUANT (P., D. & Co.).

We were the first to introduce Cascara Sagrada to the medical profession after having in our own physiological laboratories satisfied ourselves as to its valuable properties. Since that date (1877) this drug has been universally recognised as the tonic laxative *par excellence*, and has been included in most pharmacopœias.

During our investigations on Cascara Sagrada, we discovered that the laxative effect of the drug is due not alone to the bitter principle but also to a non-bitter glucoside which by an improved method of manufacture we are able to present, unimpaired, in Cascara Evacuant, an agreeable and efficient aperient which is extremely valuable in the **constipation of dogs** and other pet animals. It will generally be found that the animal will take the dose when mixed with its food. The doses are as follows: for cats, 2 to 10 minims; dogs, 5 to 60 minims; pigs, 15 to 60 minims; sheep, 30 to 90 minims; horses, 4 to 8 fl. drachms.

CASCARIN COMPOUND CONDITION POWDER, VETERINARY (P., D. & Co.).

FORMULA:

Cascarin	10 lbs.	Sulphur	5 lbs.
Gentian	5 lbs.	Fenugreek	5 lbs.
Ginger, African ..	5 lbs.	Potassium Nitrate ..	5 lbs.
Ferrous Sulphate ..	5 lbs.	Resin	5 lbs.
Linseed Meal	55 lbs.		

Cascarin is the **tonic laxative** principle of cascara bark; the quantity employed in this preparation is just sufficient to impart intestinal tone without inducing catharsis, and with it are associated **alterative,**

diuretic, diaphoretic, stimulant, tonic and hæmatinic drugs which render the powder of exceptional value for animals that are below par, off their feed, or dull-coated. Cascarin Compound Condition Powder is an excellent tonic for cattle when given once or twice daily in the feed; it is specially valuable in debility after calving. Dose for horses and cattle, 1 to 3 ounces, twice daily; sheep, ¼ to ½ ounce; pigs, 1 to 3 drachms.

CHENOPODIUM.

Oil of Chenopodium (American wormseed) has attained a considerable reputation for the treatment of **hookworm, tapeworm** and **round worms.** It is supplied in capsules containing 5 minims.

In an article by Hall and Foster published in the *Journal of Agricultural Research*, February 18, 1918, it is stated that Oil of Chenopodium is the most reliable vermifuge for **ascarides,** whether in dogs or swine. The remedy rarely fails to remove all the ascarides in a dog if the animal is starved 24 hours before treatment. The dosage for dogs of from 7 to 10 lb. is one 5-minim capsule; from 10 to 20 lb., two 5-minim capsules; from 20 to 30 lb., 15 minims; and for dogs above 30 lb., 20 minims. A full dose of castor oil should be administered with the capsules, and treatment may be repeated in seven or eight days' time.

Obviously, puppies cannot be treated in the same way as full-grown dogs, as it would be manifestly impossible to starve a puppy for 24 hours before treatment; while for cats, minute doses only should be given.

In *Revue Vét.*, 1922, Vol. 74, No. 4, Bru states that although the oil is particularly effective against round worms, it merely narcotises them; hence the need of a purgative which ensures the expulsion of the paralysed worms and also prevents absorption of the oil. He thinks it best to divide the dose into three portions, to be given at one-hour intervals. Should one treatment not prove effective another should be given, but not before eight days have elapsed. He states the dose for a dog is 10 minims for each 14 pounds body weight.

● CHLOR-ANODYNE, VETERINARY (P., D. & Co.).

EACH FLUID OUNCE CONTAINS:

Morphine Hydrochloride	4 grains
Fluid Extract of Cannabis Indica	60 minims
Chloroform	60 minims
Diluted Hydrocyanic Acid	16 minims
Oil of Peppermint	½ minim

This combination of anodynes, antispasmodics, and carminatives is concentrated in form and rapid in action; the fluid extract of

● Subject to Dangerous Drugs Regulations.

cannabis indica used in its preparation is physiologically standardised, and uniformly satisfactory results may therefore be relied on.

Chlor-Anodyne, Veterinary (P., D. & Co.) is specially indicated for use in cases of **colic** in cows, horses, sheep, and dogs ; it is of great service in the treatment of **dysentery** in horses and foals, of **canine diarrhœa,** and the **tenesmus** of distemper. For colic in horses and cattle, 3 fluid drachms may be given, and repeated in two hours if necessary. For colic in pigs, 40 minims may be given. In cases of **irritable cough,** small doses of Chlor-Anodyne, repeated at intervals, prove useful in all animals. For **enteritis and peritonitis** in horses, repeated doses of 80 to 190 minims may be given ; as a **general sedative** for all inflammatory conditions in cattle and horses, 40 to 160 minims every four hours ; sheep, 20 to 60 minims ; pigs, 10 to 40 minims ; dogs, 2 to 15 minims ; cats, ½ to 4 minims.

CHLORETONE (P., D. & Co.).

Chloretone ($C_4H_7OCl_3$) is formed through the interaction of chloroform, acetone and an alkali. It is sparingly soluble in cold water (1 in 200), more so in glycerin (10 in 100), or olive oil (12 in 100), and freely soluble in strong alcohol, chloroform, glacial acetic acid, etc. It is supplied in bottles containing ½, 1 or 4 ounces ; capsules containing either 3 or 5 grains are supplied in bottles of 25 or 100.

Chloretone is a valuable antispasmodic and nerve sedative ; it is non-irritating, non-toxic, and without effect upon the heart. Its employment is indicated in **eclampsia, chorea, colic, fits, etc.,** also as a means of quieting the patient **in operations** conducted under local analgesia.

Chloretone has both a sedative and antiseptic action on the gastric mucous membrane, and is probably the best remedy for **gastritis and vomiting** in dogs. One or two of the five-grain capsules will generally cure even when all other drugs have proved ineffective.

In cases of **tetanus,** rectal injections every four or six hours of warm olive oil containing a dose of Chloretone appropriate to the animal under treatment are very effective in controlling muscular rigidity and spasms.

Chloretone may be administered in place of morphine prior to the production of general anæsthesia by means of either chloroform or ether. The dose is from 10 to 15 grains to be given orally about half an hour prior to the administration of the general anæsthetic. This use of Chloretone materially aids the action of the anæsthetic and also has a sedative rather than an irritating effect upon the stomach, so that post-operative nausea is less likely to occur.

A veterinary surgeon informs us that he makes a practice of giving a five-grain capsule of Chloretone to a dog **previous to administering**

a worm draught, thereby avoiding the vomiting which otherwise frequently occurs.

Mr. Stainton records in the *Veterinary Journal* for January, 1924, a case of strychnine poisoning in a bulldog, which was given 15 grains of Chloretone after an emetic, and the symptoms quickly abated.

Mr. Tutt states that he has found Chloretone the best remedy for vomiting in canine distemper (*Veterinary Record*, April 12, 1924).

For the nervous symptoms of canine distemper Chloretone is specially useful. Mr. Livesey says that he has used it with excellent results, and although it seems a long while before the animal emerges from its influence, he does not consider this altogether undesirable (*Veterinary Record*, December 27, 1924).

The dose of Chloretone for cattle and horses is 2 to 4 drachms; sheep, 30 to 60 grains; pigs, 15 to 40 grains; dogs, 3 to 15 grains. It appears that, owing to race idiosyncrasy, cats do not bear Chloretone well. Mr. Kirk states that cats should not be given more than 2 grains (*Veterinary Journal*, July, 1924).

By reason of its antiseptic and analgesic properties Chloretone forms an excellent **dressing for lacerated wounds, burns, etc.** A solution in warm water (60 grains to the pint) or preferably in oil (10 grains to the ounce) may be applied on gauze, or use may be made of Chloretone Inhalant (*see page* 103).

COCILLANA COMPOUND SYRUP (P., D. & Co.).

EACH FLUID OUNCE REPRESENTS:

Tinct. Cocillana	40 minims
Tinct. Euphorbia Pilulifera	120 minims
Syrup of Wild Lettuce	120 minims
Fluid Extract of Squill	2 minims
Fluid Extract of Senega	2 minims
Tartarated Antimony	$\frac{1}{3}$ grain
Cascarin (P., D. & Co.)	8 grains
Diamorphine Hydrochloride	$\frac{8}{24}$ grain
Menthol	$\frac{8}{160}$ grain

A thoroughly efficient soothing and expectorant combination, especially suitable for dogs. Particularly adapted for the treatment of **acute bronchitis,** also of **chronic bronchitis** when the secretion is scanty and cough excessive. The dose of Syrup Cocillana Compound (P., D. & Co.) for a dog is from $\frac{1}{2}$ to 2 fluid drachms three times a day, and for a cat $\frac{1}{4}$ to 1 fluid drachm.

A writer in the *Veterinary News* for March 13, 1915, says that in cases of **chronic bronchitis and asthma in the dog,** Syrup Cocillana Compound has proved more effective than any other drug or combination of drugs.

COD-LIVER OIL EMULSION (33%), with Hypophosphites of Calcium and Sodium (P., D. & Co.).

EACH FLUID OUNCE CONTAINS :

Cod-Liver Oil (Standardised)	160 minims
Calcium Hypophosphite	8 grains
Sodium Hypophosphite	4 grains

A well-balanced preparation, well-tolerated, and of high nutritive efficiency. Valuable both for dogs and cats as a **restorative** after influenza, distemper, catarrhal pneumonia or other wasting diseases, also as an **improver of general condition** when no positive derangement is apparent. It is of special value for **rickets** in pups. The dose is from 1 to 4 fluid drachms for dogs, ½ to 2 fluid drachms for cats. Doses of ¼, ½ or 1 teaspoonful, according to the size of the bird, are given to produce a gloss on the **plumage** of show birds.

Added to skimmed milk, this emulsion produces excellent results as a **food for calves,** and obviates the use of whole milk.

The cod-liver oil used in the preparation of this emulsion is standardised to contain in each fluid ounce not less than 12,000 Vitamin A units and 1,600 Vitamin D units. The emulsion contains one-third of these quantities.

DAMIANA, NUX VOMICA, IRON AND PHOSPHORUS ELIXIR, No. 52 (P., D. & Co.).

EACH FLUID OUNCE REPRESENTS :

Damiana	60 grains
Nux Vomica	8 grains
Tinct. Citro-Chloride of Iron	16 minims
Phosphorus	$\frac{8}{200}$ grain

Damiana is tonic and diuretic, with a reputed specific effect upon the sexual organs, and the powerful nervous stimulant properties of phosphorus are specially indicated in sexual exhaustion. The tonic and stimulating effects of iron and nux vomica are valuable auxiliaries to the aphrodisiacs. The combination is much employed in cases of **atonic sexual debility.**

The dose for a dog is from ½ to 1 fluid drachm, and for stallions and bulls 2 ounces.

A Veterinary Surgeon writes :—" Two thoroughbred horses were brought to me for treatment, their respective owners complaining that they were no use at the stud as they absolutely refused to serve the mares, in spite of every effort to excite them.

" I administered Elixir Damiana Co., No. 52, 2-ounce doses in water three times daily, and within a week they were both doing stud duty, and with an occasional dose continued throughout the season.

" A Clydesdale stallion was also treated, but did not respond so rapidly. For two weeks he was given 2 ounces Elixir Damiana Co. in water thrice daily, and on returning to stud duty was dosed once daily for a few weeks. The season's record was very satisfactory."

(Also see " Fluid Extract of Damiana," page 65.)

EQUINE COUGH SYRUP (P., D. & Co.).

EACH FLUID OUNCE REPRESENTS :

White Pine Bark ..	32 grains	Sassafras Bark ..	4 grains
Grindelia	32 grains	Chloroform ..	4 minims
Wild Cherry Bark ..	16 grains	Morphine Acetate	$\frac{1}{8}$ grain
Balsam Poplar Buds	8 grains	Spirit of Nitrous Ether	64 minims
Sanguinaria	4 grains	Eucalyptol and Syrup	a.a.q.s.
Eriodictyon ..	4 grains		

Equine Cough Syrup (P., D. & Co.) is an effective combination of bronchial sedatives and stimulating expectorants specially prepared to meet the requirements of veterinary practice. It has been found of great service for the relief of **catarrhal conditions of the respiratory tract** in horses and also in other animals. When given in the initial stage of **bronchitis, laryngitis, pharyngitis, influenza,** and other respiratory diseases, the establishment of a persistent cough is often avoided, and no fear of gastro-intestinal disturbance need be entertained.

For **chronic cough** there is probably no better remedy than Equine Cough Syrup given continuously three or four times daily, and it is particularly useful in the **bronchial troubles of pet dogs.** It promotes secretion, abates congestion, and lessens the irritation caused by dry, tenacious discharges.

The dose of Equine Cough Syrup (P., D. & Co.) for horses and cattle is from 1 to 3 fluid ounces, and for dogs from $\frac{1}{2}$ to 2 fluid drachms, thrice daily. If any difficulty is experienced in administering it as a draught, a little bread-crumb may be mixed with it so as to form an electuary to be smeared over the back of the tongue ; indeed, some consider that this is the best way of giving medicines in acute affections of the respiratory tract.

ERGOT ASEPTIC (P., D. & Co.).

A physiologically-standardised, non-alcoholic, concentrated preparation of ergot, specially prepared for hypodermic administration.

Hypodermic injections of Ergot are specially useful for arresting **uterine hæmorrhage,** or **post-partum flooding** in cows and ewes. The drug is also used in **hæmaturia,** in **retention of the afterbirth,** and as a general tonic for the muscular system.

Ergot Aseptic (P., D. & Co.) is twice the strength of the B.P. Liquid Extract, and is put up in hermetically-sealed bulbs, each of which contains 1 c.c. (16 minims). The dose of Ergot Aseptic for cows is 2 to 8 fl. drachms ; mares, 1 to 3 fl. drachms ; ewes, 15 to 30 minims ; sows, 5 to 20 minims ; bitches, 15 minims ; cats, 1 to 5 minims. The dose should be injected deeply into the muscular tissues with due aseptic precautions.

EXTRACTS, FLUID, STANDARDISED (P., D. & Co.).

We prepare a comprehensive series of Standardised Fluid Extracts, and commend them to the notice of veterinary surgeons as affording a much more economical and reliable mode of medication than ordinary tinctures. They may be given as a draught or may be incorporated with bread-crumb to form a bolus, which may advantageously be enclosed in one of the " P., D. & Co." Gelatin Capsules described on page 55. If desired, they may be readily reduced to tincture strength by the addition of alcohol or a mixture of glycerin and water.

In the manufacture of fluid extracts we **standardise chemically** all drugs containing alkaloids or other active principles which can be thus estimated. Those drugs which possess toxic properties that cannot be satisfactorily assayed by ordinary methods are **tested physiologically.** By one or other of these methods each fluid extract is adjusted to a fixed standard of strength, and successive supplies of any one kind possess the same degree of therapeutic activity. It may be pointed out that more exact and more immediate effects can be obtained by the use of " P., D. & Co." fluid extracts of catechu, ergot, gentian, ginger, nux-vomica, etc., than by the use of the powdered drugs they represent.

Doses :—It must be understood that in all cases the doses stated are only suggestive, as the precise quantity must be determined by the veterinarian from his knowledge of the conditions and the nature of the drug.

When ordering or prescribing, please mention the series number as well as the name of the drug.

Except in the case of those marked with an asterisk, one fluid ounce of each preparation is equivalent to one ounce of drug of standard strength.

No.

3. **Aconite, U.S.P.**

Contains 0·5 gramme of ether-soluble alkaloids in 100 c.c. Twelve times the strength of the B.P. Tincture ; one-and-a-half times that of Fleming's Tincture. Circulatory sedative, anodyne, diuretic, diaphoretic, and febrifuge. Given in sthenic fevers and in the initial stages of acute inflammatory diseases. Its use has proved beneficial in **pneumonia** and **laminitis** where the pulse is greatly accelerated. It slows and steadies the heart's action and soon gives a stronger pulse. Dose for cattle, 3 to 10 minims ; horses, 2 to 5 minims ; sheep or pigs, ¼ to 1 minim ; dogs, $\frac{1}{20}$ to $\frac{1}{5}$ minim ; cats, $\frac{1}{40}$ to $\frac{1}{20}$ minim, well diluted with water. Small doses at short intervals are preferable to larger ones less frequently. Horses will often take it in the drinking water.

Eight fluid ounces of this Extract diluted to a pint with soap liniment provides an anodyne application of the same aconite strength as the B.P. Liniment, adapted for use in rheumatism, colic, etc. This may be diluted, if necessary, in quantity such as will be free from danger of toxic absorption. It is well not to employ it for canine subjects. A modified form of A.B.C. Liniment which will contain the usual proportions of aconite, belladonna and chloroform, without greasiness, may be conveniently made by mixing Fluid Extract Aconite, 4 fl. ounces ; Fluid Extract Belladonna, 3 fl. ounces ; Chloroform, 3 fl. ounces ; Camphor, 4 drachms ; Soap Liniment, to measure 18 fl. ounces.

NOTE.—*As preparations of aconite are liable to gradual deterioration, they should not be purchased in quantity larger than will be used in one year.*

669. **Belladonna Leaves.**

Standard, 0·35% of alkaloids. Ten times the strength of the B.P. Tincture.

Respiratory stimulant, anodyne, antispasmodic, mydriatic, anti-galactogogue Dose for cattle, 1 to 3 fl. drachms; horses, ½ to 2 fl. drachms; sheep, 10 to 30 minims; pigs, 2 to 10 minims; dogs, 1 to 6 minims.

564. ***Belladonna Root, B.P.**

Standard, 0·75% of alkaloids. Twice the strength of the B.P. Liniment.

Dose for cattle, 30 to 90 minims; horses, 15 to 60 minims; sheep, 5 to 30 minims; pigs, 2 to 8 minims; dogs, 1 to 5 minims. An excellent anodyne application may be prepared by diluting 4 ounces of this liquid extract with 3 fluid ounces of glycerin and 1 ounce of water; if desired a little soap liniment may be added.

Fluid Extract of Belladonna has been recommended as a valuable auxiliary to Phytolacca in the treatment of **mammitis** (See "Phytolacca," p. 66).

528. ***Benzoin Compound for B.P. Tincture.**

One fluid ounce represents about 131 grains of Benzoin; 99 grains of Prepared Storax; 33 grains of Tolu Balsam; and 26 grains of Aloes. Three times the strength of the B.P. Tincture.

Stimulant expectorant. Dose for cattle, 2 to 8 fl. drachms; horses, 2 to 4 fl. drachms; sheep, 5 to 20 minims; pigs, 5 to 15 minims; dogs, 2 to 10 minims.

This preparation possesses stypic properties, and is applied to check hæmorrhage from wounds, also after docking and, when diluted, for dressing indolent ulcers, etc. It is also valuable as an inhalation in bronchial and laryngeal affections.

592. ***Buchu for B.P. Infusion.**

One fluid ounce represents half an ounce of standard drug. Ten times the strength of the B.P. Infusion.

Diuretic, antiseptic, stimulant. Efficacious in chronic irritability of the bladder, manifested by frequent urination. Dose for horses, ½ to 1 fl. ounce; dogs, 50 to 100 minims.

106. **Cannabis Indica.** (See "Normal Liquid," p. 73.)

665. **Capsicum.**

Twenty times the strength of the B.P. Tincture.

Stimulant and stomachic, promotes secretion of gastric and pancreatic juices, useful in **flatulent colic.** Dose for cattle, 20 to 60 minims; horses, 15 to 40 minims; sheep and pigs, 5 to 10 minims; dogs, 1 to 3 minims—well diluted. Externally, capsicum is a rubefacient and counter-irritant.

116. **Cascara Sagrada.**

Tonic laxative. Very effective in chronic constipation if given in small frequently repeated doses. Doses for dogs and small animals: as a tonic laxative, 5 to 15 minims, three times a day; as a purgative, 20 to 60 minims, morning and evening.

Cascara sagrada was introduced by us in 1877, since when our preparations of this most important drug have been universally recognised as possessing marked superiority and reliability.

544. ***Catechu for B.P. Tincture.**

One fluid ounce represents about 263 grains of Catechu, and 66 grains of Cinnamon Bark. Three times the strength of the B.P. Tincture.

Powerful astringent. Employed in chronic and colliquative **diarrhœa.** Beneficial in **coccidiosis** in poultry and entero-hepatitis of turkeys—half a drachm should be added to each gallon of drinking water. Dose for cattle, ½ to 1 fl. ounce; horses, 2 to 4 fl. drachms; sheep, 1 to 3 fl. drachms; pigs, 10 to 60 minims; dogs, 5 to 20 minims.

692. **Cinchona Miscible.**

Standard, 5% total alkaloids.

Tonic, febrifuge. Dose for cattle, 2 to 6 fl. drachms; horses, 1 to 4 fl. drachms pigs, 10 to 60 minims; dogs, 5 to 30 minims.

177. **Damiana.**

Aphrodisiac, sudorific, diuretic. A general tonic to the nervous system. Much employed in cases of functional **sterility.** Dose for cattle, ½ to 1 fl. ounce; horses, 2 to 6 fl. drachms; dogs, 10 to 30 minims.

Digitalis. (See "Normal Liquid," p. 73.)

187. **Echinacea.**

This drug has been highly recommended as an alterative in septic infection. It appears to stimulate functional activity and metabolism, and is employed in **anæmia, glandular swellings,** and all forms of blood dyscrasia; also as an auxiliary to local treatment in poll-evil, fistulous withers, etc. Dose for cattle, 3 to 6 fl. drachms; horses, 2 to 4 fl. drachms; sheep, 25 to 50 minims; pigs, 15 to 30 minims; dogs, 10 to 20 minims.

Ergot. (See "Normal Liquid," p. 73.)

215. **Gelsemium.**

Standard, 0·5% alkaloids. Ten times the strength of the B.P. Tincture.

Sedative to the nervous and arterial systems, antispasmodic, febrifuge. Dose for cattle, 1 to 3 fl. drachms; horses, 1 to 2 fl. drachms; sheep, 10 to 30 minims; pigs, 5 to 20 minims; dogs, 1 to 3 minims.

527. ***Gentian Compound for B.P. Tincture.**

One fluid ounce represents about 263 grains of Gentian Root, 99 grains of Bitter Orange Peel, and 33 grains of Cardamom Seeds. Six times the strength of the B.P. Tincture.

Tonic, stomachic. Dose for cattle, 60 to 160 minims; horses, 60 to 120 minims; sheep, 5 to 30 minims; pigs, 5 to 20 minims; dogs, 2 to 10 minims.

219. **Ginger.**

Ten times the strength of the B.P. Tincture.

Stimulant, carminative, sialagogue. Dose for cattle, 1 to 3 fl. ounces; horses, 1 to 2 ounces; sheep, 10 to 60 minims; pigs, 5 to 30 minims; dogs, 2 to 10 minims.

Glycyrrhiza. (See "Liquorice.")

226. ***Golden-seal, Aqueous.**

Represents the therapeutic principles of hydrastis without its resinous extractive. Standard, 1% of hydrastine.

Tonic to mucous membrane. Miscible with water, hence preferable, in some instances, to Fl. Ext. Hydrastis, No. 663 (*see below*); it is also less irritating when used as an injection.

675. **Hamamelis, B.P.**

Astringent, styptic, tonic. Useful in diarrhœa and in **gastric hæmorrhage.** Dose for cattle, ½ to 1 fl. ounce; horses, 2 to 4 fl. drachms; dogs, 5 to 20 minims. One ounce diluted with 7 ounces of water may be injected into the bladder or rectum in cases of hæmorrhage.

663. **Hydrastis, B.P. (Golden-seal).**

Standard, 2% hydrastine. Ten times the strength of the B.P. Tincture.

Given internally, Hydrastis is tonic laxative and cholagogue. Dose for cattle, 2 to 8 fl. drachms; horses, 1 to 4 fl. drachms; sheep, 10 to 40 minims; pigs, 10 to 30 minims; dogs, 5 to 20 minims; cats, ½ to 3 minims. Topical applications are tonic to mucous tissues.

Employed both orally and as a vaginal douche in uterine inflammations. "Used with much success in the treatment of **polyuria and bloody milk**" (*Veterinary Notes*, Dec., 1907).

244. **Hyoscyamus.**

Prepared from biennial henbane of second year's growth. Standard, 0·055 to 0·075% mydriatic alkaloids. Ten times the strength of the B.P. Tincture.

Antispasmodic, sedative, hypnotic. Employed in spasmodic cough, tetanus, chorea

and epileptic convulsions of dogs. Dose for cattle, 2 to 8 fl. drachms; horses, 1 to 4 fl. drachms; sheep, 10 to 30 minims; pigs, 5 to 20 minims; dogs, 2 to 10 minims; cats, ½ to 2 minims.

Indian Hemp. (See "Cannabis Indica.")

585. **Ipecacuanha, B.P.**

Standard, 2% alkaloids. Twenty times the strength of the Vinegar (B.P. 1898) or Wine (B.P. 1914).

Diaphoretic, expectorant, amœbicide. Has given good results in **entero-hepatitis** of turkeys and in **bovine coccidiosis.** Dose for cattle and horses, 1 to 2 fl. drachms; sheep, 30 to 60 minims; pigs, 5 to 15 minims; dogs, 1 to 5 minims; cats, 1 to 3 minims. As an emetic for pigs or dogs, from 15 to 30 minims may be given.

264. **Jaborandi.**

Standard, 0·55 to 0·65% alkaloids. Five times the strength of the (B.P. 1898) Tincture.

Sialogogue, expectorant, diaphoretic, diuretic; increases intestinal secretion and peristalsis. Dose for cattle, 2 to 4 fl. drachms; horses, 1½ to 3 fl. drachms; sheep, 10 to 30 minims; pigs, 10 to 25 minims; dogs, 5 to 15 minims.

290. **Liquorice.**

Emollient and demulcent to mucous surfaces. Useful in cough, catarrh, irritation of the urinary tract, etc. An excellent vehicle for nauseous medicines.

Dose for cattle, ¼ to 1 fl. ounce; horses, 1 to 6 fl. drachms; sheep, 15 to 60 minims; pigs, 10 to 40 minims; dogs, 2 to 10 minims; cats, 1 to 5 minims.

299. **Lobelia.**

Eight times the strength of the (B.P. 1885) Tincture.

Expectorant, diaphoretic, narcotic. Emetic in large doses. Dose for cattle, 1 to 8 fl. drachms; horses, ½ to 4 fl. drachms; pigs, 5 to 20 minims; dogs, 2 to 10 minims.

Male Fern. (See page 69.)

324. **Mugwort (Artemisia).**

Alterative, tonic, anthelmintic, narcotic, and emmenagogue. Dose for cattle, ¼ to 1 fl. ounce; horses, 2 to 6 fl. drachms; sheep, 1 to 3 fl. drachms; pigs, 30 to 60 minims; dogs, 20 to 60 minims; cats, 5 to 20 minims.

Much esteemed as a cleanse for **retained afterbirth** in cattle, in which use its tonic effect is also valuable. One fluid ounce may be given twenty-four hours after calving, repeated in twelve hours, and again twelve hours after the second dose.

Also see note on Ergot, page 73.

565. **Nux Vomica, B.P.**

Standard, 1·5% strychnine. Twelve times the strength of the B.P. Tincture.

Nervine, tonic, diaphoretic, laxative. Increases the digestive secretions, stimulates the movement of the stomach, and promotes appetite. It increases intestinal peristalsis, and is useful in cases of constipation and impaction. Dose for cattle, 30 to 60 minims; horses, 20 to 40 minims; sheep, 5 to 20 minims; pigs, 3 to 10 minims; dogs, ½ to 1 minim; cats, $\frac{1}{20}$ to ⅓ minim.

369. **Phytolacca Root (Poke Root).**

Alterative, deobstruent; in large doses, cathartic and emetic. Dose for cattle, 60 to 120 minims; horses 30 to 80 minims; sheep, 8 to 15 minims; pigs, 5 to 10 minims; dogs, 2 to 5 minims; cats, 1 to 2 minims.

Lynch, writing in *The American Journal of Veterinary Medicine*, states there is no remedy to compare with phytolacca for the cure of acute **inflammation of the mammary gland.** It may be applied as an ointment prepared by incorporating the fluid extract in wool fat, in addition to which the fluid extract should be given orally, preferably with a small dose of fluid extract of aconite, to assist in counteracting inflammation. Tyler (*Ibid.*) advises the addition of fluid extract of belladonna in order to reduce secretion and relieve pain from pressure. He gives 6 drachms of fluid extract of phytolacca and 2 drachms of fluid extract of

belladonna leaves in hot water thrice daily, and applies a cataplasm of 2 ounces of fluid extract of phytolacca and 1 ounce of fluid extract of belladonna leaves in a glycerin and kaolin basis, covers with cotton wool and supports with a suspensory bandage. A good purge of Epsom salts should be given at the outset, and injections of Streptococcus-Staphylococcus Bacterin (*see page* 21) are of great assistance.

Pilocarpus. (See "Jaborandi.")

378. **Quassia.**

Ten times the strength of the B.P. Tincture.

Bitter tonic. Dose for horses, 2 to 8 fl. drachms; sheep, 10 to 30 minims; pigs, 5 to 15 minims; dogs, 2 to 10 minims.

One ounce diluted with 20 ounces of water, used as a rectal injection, destroys thread worms and round worms. The same mixture with the addition of 2 ounces of glycerin, dabbed on the skin, protects animals from flies and other insect pests.

A veterinary surgeon informs us that well brushing a dog's coat with a mixture of 1 ounce of Fluid Extract of Quassia and 19 ounces of methylated spirit is a most effective means of getting rid of fleas.

535. ***Rhubarb Compound for B.P. Tincture.**

One fluid ounce represents about 350 grains of Rhubarb Root, 44 grains of Cardamom Seeds, and 44 grains of Coriander Fruit. Eight times the strength of the B.P. Tincture.

Cathartic, stomachic, tonic, astringent. Dose for cattle, 2 to 8 fl. drachms; horses, 2 to 6 fl. drachms; sheep, 30 to 90 minims; pigs, 30 to 60 minims; dogs, 15 to 30 minims; cats, 5 to 10 minims.

407. **Saw Palmetto Berries (Sabal).**

Diuretic, sedative, nutritive. Of value in inflammation of the kidneys or bladder, and as a remedy for scanty or turbid urine. Also employed in impotence. Dose for cattle, 1½ to 3 fl. ounces; horses, 1 to 2 fl. ounces; sheep, 1 to 3 fl. drachms; pigs, ½ to 2 fl. drachms; dogs, ¼ to 1 fl. drachm; cats, 10 to 30 minims.

Squill. Tested physiologically. (See "Normal Liquid," page 73.)

444. **Stavesacre Seed.**

Parasiticide. As a lotion for the destruction of lice, 1 ounce may be diluted with 20 or 30 ounces of water. A useful application for **mange** in horses is obtained by incorporating 1 ounce of the fluid extract in 10 ounces of simple ointment.

666. ***Valerian, Ammoniated.**

Four times the strength of the B.P. Tincture.

Antispasmodic, nerve sedative, carminative. Useful in chorea following distemper in dogs. Dose for cattle and horses, 30 to 90 minims; sheep, 15 to 40 minims; pigs, 10 to 30 minims; dogs, 5 to 15 minims; cats, ½ to 2 minims, diluted.

Veratrum Viride. See "Veratrone," page 92.

671. **Viburnum Prunifolium, B.P. (Black Haw).**

Uterine and ovarian sedative and tonic; astringent, alterative, diuretic. Employed in **threatened abortion** and as a corrective of chronic tendency to miscarry; for the latter purpose it should be given continuously in moderate doses for several weeks prior to the period at which miscarriage usually takes place. Dose for cattle, 1 to 4 fl. ounces; horses, 1 to 4 fl. ounces; sheep, 2 to 4 drachms; pigs, 15 to 60 minims; dogs, 10 to 40 minims; cats, 2 to 10 minims.

See also "Liquor Sedans," page 68.

Wormseed. See "Chenopodium Oil," page 58.

Standardised Fluid Extracts (P., D. & Co.) are supplied in bottles of 4, 8, 16 *and* 80 *fluid ounces*

When ordering, please specify "P., D. & Co."

GLYCERIN SUPPOSITORIES (P., D. & Co.).

These suppositories contain 95 per cent. of pure glycerin with an excipient that renders them permanent under ordinary conditions without lessening their therapeutic activity.

Glycerin promptly unloads the lower bowel without griping and without disturbing the stomach. These suppositories, which are primarily prepared for the human subject, and are made in three sizes (Adults' size, Children's size, and Infants' size), will be found very useful in the **constipation of pet dogs.**

HAMAMELIN COMPOUND SUPPOSITORIES (P., D. & Co.).

EACH SUPPOSITORY CONTAINS :

Hamamelin	1 grain
Zinc Oxide	5 grains
Bismuth Oxychloride	3 grains
Tincture of Hydrastis	20 minims
Cacao Butter	q.s.

Recommended in the treatment of **hæmorrhoids** in dogs or small animals, also of other affections of the anus and rectum where astringent and sedative effects are required.

HEMATIC HYPOPHOSPHITES (P. D. & Co.).

EACH FLUID OUNCE CONTAINS :

Potassium Hypophosphite	1½ grains
Manganese Hypophosphite	1 grain
Iron Hypophosphite	1¼ grains
Calcium Hypophosphite	1 grain
Quinine Hypophosphite	$\frac{7}{15}$ grain
Strychnine Hypophosphite	⅛ grain

The tonic, stimulant and nutritive properties of this preparation are productive of excellent results in a great variety of disorders, especially in **weakness, anæmia, rickets and malnutrition,** also in **nervous affections and after wasting diseases.**

The dose for a dog is from ¼ to 1 fluid drachm.

LIQUOR SEDANS.

EACH FLUID OUNCE REPRESENTS :

Viburnum Prunifolium (Black Haw)	60 grains
Hydrastine to represent Fl. Ext. Hydrastis	30 minims
Piscidia Piscipula (Jamaica Dogwood)	30 grains
Aromatics	q.s.

Liquor Sedans exerts a direct sedative influence on the uterus and is of great value in cases of ovarian congestion, enlargement of the uterus, uterine engorgement, etc. In threatened miscarriage, in acute and chronic inflammation of the uterus and ovaries, and in uterine hæmorr-

hage, Liquor Sedans may be prescribed with advantage. The suggested dose for a mare is three tablespoonfuls in half a pint of hot water twice daily.

MALE FERN, LIQUID EXTRACT (Oleoresin of Aspidium, U.S.P.).

Extractum Filicis Liquidum, P.B., standardised to contain not less than 20% of filicin. Supplied in bottles of 1 fluid ounce, also in Soluble Gelatin Capsules, each containing 28 minims (in boxes of 12), and in capsules containing 7 minims suitable for toy dogs.

The liquid extract (oleoresin) of male fern is the most effective remedy we possess for **tape worm.** It is said merely to stupefy the parasite and cause it to lose its hold on the intestinal walls, so that a simultaneous or subsequent saline purge is necessary for its expulsion —castor oil should not be given, as any oleaginous substance favours systemic absorption of the filicin, which may then produce undesirable effects. It is beneficial to administer a purgative for a day or two before the vermifuge, in order to have the intestinal canal as clear as possible for the better exposure of the parasite to the drug.

The dose for a horse is from 2 to 6 drachms ; for a dog, from 15 to 60 minims, administered as an emulsion or in capsules, to be given when the stomach is empty. In the case of dogs, it has been found valuable to give a capsule of Chloretone (*see page* 59) half an hour before the vermifuge, as a precaution against vomiting.

The administration of male fern has been found beneficial in the treatment of **liver rot** (fluke disease) in sheep. For sheep weighing 70 pounds a safe and effective dose is stated to be 1 drachm (or two capsules) of the extract on each of two successive mornings. Lambs of 40 pounds weight may be given half these doses. The animals should be removed from pasture on the evening prior to the administration of the drug, which may be conveniently administered in capsules or as an emulsion made by shaking 1 drachm of the extract with 1 ounce of milk.

METAGEN (P., D. & Co.).

A combination of the water-soluble and fat-soluble vitamins in concentrated form for therapeutic use. Supplied in bottles containing 50 capsules. As a general rule puppies may be given one capsule before food, twice or thrice daily, and corresponding doses to other animals.

It is now well recognised in medical and veterinary circles that, in order to ensure full development in growth, efficiency, general tone, and resistance to disease, animals, as well as human beings, must be supplied with food containing a necessary amount of vitamins, or, as they are also called, accessory food factors. Even with a diet well balanced in respect of proteins, fats, carbohydrates and mineral matter, and even though the assimilative organs are normally active, meta-

bolism is not promoted if vitamins are absent. The processes to which many articles of food are subjected, such as sterilisation, storage, excessive cooking, the fine milling of wheat, polishing of rice, etc., may either partly or wholly deprive them of their vitamin content.

It is worthy of note that the vitamin content of milk depends to a certain extent on the food supplied to the animals concerned, and hence it is that the nutritive value of milk from stall-fed cows in winter is frequently much lower than that obtained from grazing cows. The same argument applies to other animals, the absence of vitaminous diet leading to a tendency to **scrofula** in pigs, to litters of **ricketty puppies,** pet dogs with **indigestion** and **interdigital and other abscesses,** cage birds suffering from **polyneuritis,** and to a large variety of other conditions due to malnutrition. In all of these cases Metagen is indicated.

We have received very favourable reports of the use of Metagen. One veterinary surgeon writes, under date of March 3, 1921, as follows :—

" The puppy with **rickets** has shown a marked improvement since he has been under Metagen, and I shall certainly try it again in future cases."

A prominent breeder of collies has also used Metagen, and he writes, under date of February 19, 1921 :—

" The puppies are now able to stand up to their food, and I do think if the improvement continues they will eventually become straight ; their case was almost hopeless."

Dr. Readman, a prominent breeder of prize fowls, writes :

" Of the last brood of eighteen chicks I lost all but four. These four are living and doing well ; thanks to Metagen, they are showing unusual growth." (March 23, 1921.)

Mr. Brooke reports in the *Veterinary Record*, September 15, 1923, wonderful effects rapidly produced in cases of **catarrh of the bowels** with general debility in young puppies when improper diet has been replaced with suitable food combined with Metagen.

An F.R.C.V.S. reports : " A litter of pedigree puppies, eight in number, all apparently in good health, and all reared by the same mother, received the same amount of exercise, fresh air, sunshine and comfortable housing.

" When four months old, one of the litter (a male) began to show symptoms of rickets. The disease developed rapidly, the ends of the long bones enlarged, the little animal could not raise itself on its hind legs, and the fore legs curved outwardly at the elbows, so that the puppy resembled a small bull-dog. All the other puppies were in a healthy condition.

" It was resolved to try the effects of vitamins, and Metagen (Parke, Davis & Co.) was used ; two capsules being given three times daily.

" In order to observe whether any improvement was due to the Metagen, no other treatment was adopted ; the food, fresh air, sun-

shine, exercise, and housing of all the litter remained the same as before the treatment was begun.

" After two months' treatment with Metagen this puppy could run nearly as fast as the others, could raise himself on his hind legs and climb a short staircase ; the ends of the long bones and the fore legs had returned almost to the normal."

In a case of a seven-months-old wolfhound which was suffering from rickets, as a result of three weeks' treatment with Metagen the dog was much stronger and inclined to play with the other dogs—a thing he had never done before. A combination of Metagen and Parathyroid was then given, and another month later we received the following letter :

" I am delighted with the result of the treatment recommended for the wolfhound with rickets. The legs are straightening wonderfully, and the enlargements of the epiphyses of the radius are somewhat smaller. The leg from the knee downwards instead of being at an angle of 95° is perpendicular. The dog is very active and in splendid condition. The radius is somewhat bowed yet, but much better."

A correspondent writes with enthusiasm on the beneficial effects of Metagen on the condition of racing pigeons, particularly when they are subjected to the severe strain of long races. He makes a practice of giving each bird one capsule before the basket journey, which sometimes lasts three or four days. His experience is that the effect of Metagen is much more lasting than that of the iron tonics used by some fanciers.

Again, this expert has found that nothing equals a dose of Metagen for promptly restoring a bird exhausted by the effort of flying long distances—in one case he mentions 200 miles, in another 260 miles.

This correspondent has also found Metagen, in his own words, " very, very good " for young birds : he gives two capsules a day, with the result that the birds grow larger, with firmer flesh and better feathers.

METAGEN AND COD-LIVER OIL EMULSION.

Each fluid ounce contains 200 minims of the finest standardised Cod-Liver Oil and 10 grains of Metagen ; it thus combines the therapeutic properties of the fat soluble vitamins of cod-liver oil with active and concentrated water-soluble vitamin extracts of vegetable origin.

The administration of this preparation is specially valuable for the treatment of under-developed animals, especially puppies showing signs of deficiency diseases such as **rickets, poor dentition** or **malnutrition.** Experiments have shown that cod-liver oil has a decidedly beneficial effect in aiding the convalescence of dogs suffering from **canine distemper.** Metagen Emulsion and Cod-Liver Oil is therefore to be regarded as a useful aid in the supplementary treatment of **distemper** and other **infectious diseases.** As a reconstructive tonic it supplies

concentrated nutrient material for building up the animal's strength and vitality. It is said to be valuable for the treatment of **barking fits** or **black tongue** in dogs which are thought by some authorities to be associated with a dietary deficiency.

As this product contains the anti-rachitic vitamin it is recommended for the treatment of **leg weakness in chickens.**

It also prevents and corrects **nutritional roup.** The emulsion should be added to the food in the proportion of one tablespoonful for each dozen birds, for young chicks two teaspoonfuls for 50 birds will suffice and will be found useful for increasing body weight and promoting healthy growth.

Vitamin A, which is present in Cod-Liver Oil, has been recommended for curing **scouring in piglets** (*Lancet* June 28, 1924).

NEMA CAPSULES.

Soft Gelatin Capsules of Tetrachlorethylene coloured red. No. 188 containing 3 minims, suitable for puppies ; No. 187 containing 1 c.c. for dogs ; No. 189 containing 2·5 c.c. for lambs and pigs ; No. 190 containing 5 c.c. for sheep, large pigs, etc.

Tetrachlorethylene is probably one of the safest known anthelmintics for the treatment of **hookworms** and **round worms.** Laboratory experiments show that it is safer than Carbon Tetrachloride for very young animals. It apparently does not cause asphyxiation in case the drug should accidentally be released into the mouth or upper respiratory tract.

Prior to the administration of Tetrachlorethylene it is advisable to fast the animal long enough to empty the stomach but not long enough to cause weakness or distress. The stomachs of dogs as a rule empty well over night, and a small meal of soft food may be allowed in the afternoon of the day preceding the treatment, but any portion of the meal that is not eaten should be taken away about six o'clock. As it may require about 1½ hours for the capsule to dissolve in the stomach, no food or water should be allowed until three or four hours after the capsule was administered. For a few days preceding the treatment it is advisable to keep the animal on a diet of cereals, with only a small amount of meat, avoiding fat, oils, cream, milk, etc. It is said that the simultaneous administration of purgatives has a tendency to reduce somewhat the effectiveness of Tetrachlorethylene, but it may be advisable to give a dose of Magnesium Sulphate an hour or an hour and a half after the Tetrachlorethylene. The Magnesium Sulphate is best given dry in a gelatin capsule.

Dosage.—For large dogs a dose of 0·2 c.c. (about 3 minims) per kilogram (about 2⅕ lb.) of body weight has been found to be effective for the removal of hookworms. Dogs weighing 8 lb. to 10 lb. may have one capsule (No. 187) of 1 c.c. ; animals weighing 10 lb. to

20 lb. may have two capsules of 1 c.c. each; animals weighing 20 lb. to 30 lb. may have three capsules of 1 c.c. each. Puppies and smaller breeds may be given 3 minims for each 2 lb. of body weight; Lambs, 2·5 c.c.; Sheep, 5 c.c.; Pigs, 2·5 c.c. or 5 c.c. according to weight.

Caution.—Tetrachlorethylene should not be given when there are any lesions in the kidney or liver, such as jaundice or nephritis, or during or following infection or debilitating diseases.

NORMAL LIQUIDS.

Under this title are now included several physiologically standardised preparations formerly termed fluid extracts. Each c.c. represents 1 gramme of drug of standard strength. These Normal Liquids are of proved activity and of uniform strength.

Normal Liquid Cannabis Indica.

Tested physiologically.

Two-and-a-half times the strength of the B.P. Tincture.

Narcotic, antispasmodic, analgesic, sedative. A valuable anodyne in enteritis, etc., it does not lock up the secretions, and (unlike opium) it does not cause constipation. Dose for cattle, 2 to 4 fl. drachms; horses, 1 to 3 fl. drachms; sheep and pigs, 5 to 10 minims; dogs, 2 to 5 minims. To allay the spasms of tetanus larger doses (1 ounce for a horse) have been recommended.

The normal liquid may be given in linseed or castor oil, or it may be added to four volumes of whisky and the mixture stirred into thick gruel.

Normal Liquid Digitalis.

Standardised physiologically.

Ten times the strength of the B.P. Tincture.

Cardiac tonic and sedative, indirectly diuretic. Vaso-constrictor. Dose for cattle, 10 to 30 minims; horses, 10 to 25 minims; sheep, 2 to 8 minims; pigs, 2 to 5 minims; dogs, ½ to 2 minims.

Every package bears on its label the date on which the contents were physiologically tested. It is recommended that not more than will suffice for one year's requirements should be ordered at one time. We do not exchange or give credit for preparations of digitalis.

Normal Liquid Ergot.

Latest crop. Tested physiologically.

Uterine stimulant, ecbolic, vaso-constrictor. Dose for cattle, ½ to 1 fl. ounce; horses, 2 to 6 fl. drachms; sheep, 60 to 120 minims; pigs, 60 to 120 minims; dogs, 20 to 60 minims; cats, 2 to 10 minims.

In retention of the placenta, 4 fl. drachms of this fluid extract with 4 fl. drachms of Fluid Extract of Mugwort are given to cows, with or without purgatives as may be indicated, every four hours till the membrane comes away (*Veterinary Record*, Nov. 17, 1906, pp. 315 and 317).

Also see "Ergot Aseptic," p. 62.

Normal Liquid Squill.

Tested physiologically.

Five times the strength of the B.P. Tincture, and about four times the strength of Vinegar of Squill, B.P.

Expectorant, cardiac tonic, diuretic. Dose for cattle, 1 to 2 fl. drachms; horses, 30 to 90 minims; pigs, 3 to 10 minims; dogs, 1 to 5 minims; cats, $\frac{1}{10}$ to ½ minim, well diluted.

NUCLEIN (P., D. & Co.).

Nuclein is a proteid principle found in various vegetable and animal cells, also in the serum of blood. For use in medicine it is prepared from yeast. Nuclein exists in the yeast cells in the form of a nucleo-proteid. As issued for medicinal use, it is in the form of a sodium salt of nucleinic acid. The solution is preserved with chloretone, which also exerts an analgesic action in the neighbourhood of an injection.

In many diseases, Nuclein forms a most valuable adjunct to serum, vaccine or other methods of treatment.

The remarkable improvement in an animal's power of disease-resistance which may be brought about by the injection of Nuclein renders the drug of great value in the treatment of **pneumonia, pleurisy, strangles, influenza, distemper, pyæmic arthritis, purpura hæmorrhagica,** and other pathological changes due to bacterial infection. Whenever **fever** is present and the blood shows a low content of white corpuscles, Nuclein should be given. It should be used as an auxiliary to all surgical treatment of **septic conditions, boils, abscesses, indolent ulcers and slow-healing wounds**; by increasing the number of white blood corpuscles it greatly enhances the natural powers of self-repair.

In the treatment of **canine distemper,** Nuclein Solution (P., D. & Co.) has proved of very great value. It is ordinarily given by hypodermic injection, the dose being calculated at 1 minim of the 5% solution per pound of body-weight, to be diluted with an equal amount of physiological sodium chloride solution. The injection should be repeated twice daily, if symptoms require, for two or three days. If oral administration is preferred, twice the above-mentioned amount should be given in a little milk every three or four hours. The injection of Anti-Distemper Serum (*see page* 5) is a valuable auxiliary to Nuclein treatment; it appears to cut short the course of the disease and to promote a rapid convalescence.

Preparations of Nuclein.

Nuclein Solution, Veterinary, 10% for hypodermic use.—Supplied in ampoules containing 5 c.c. It is permanent and may be used without dilution, hence not so much fluid has to be injected as in the case of the 5% solution, and there is less likelihood of swelling or irritation being caused. *The dose for a horse or cow* is 5 c.c.

Nuclein Solution, Veterinary, 5%, for hypodermic use.—The *average dose for a horse or cow* is 2 to 4 fluid drachms (8 to 15 c.c.) diluted with an equal quantity of physiological sodium chloride solution and injected *deeply into muscular tissue,* with due aseptic precautions. *For dogs* the dose is calculated at one minim per pound of body-weight, diluted and injected as described above. It has occasionally been reported that swelling has occurred subsequent to an injection of this solution, particularly if it has been given subcutaneously and not

intramuscularly; to avoid this, it is recommended that if subcutaneous administration is resorted to, the above-mentioned dose should be further diluted with distilled water.

Nuclein Hypodermic Tablets, Veterinary.—Each tablet is equivalent to 30 minims of 5% Nuclein Solution. The tablets being quickly soluble, any strength of solution may be made at a moment's notice, as required; *e.g.*, 1 tablet dissolved in 30 minims of sterile distilled water will form a 5% Nuclein Solution.

Doses of the Tablets.—For a horse or cow, dissolve 6 tablets in 6 fl. drachms of sterile distilled water, and inject hypodermically. For a dog, *for every* 30 *pounds* of body-weight dissolve 1 tablet in 30 minims of sterile distilled water, and inject hypodermically twice daily for two or three days if symptoms require; if to be given orally, 1 tablet for every 15 pounds of body-weight should be given in a little milk. The tablets are permanent and accurate, and are convenient for carrying in the pocket-case. The injection of a solution prepared from these tablets does not give rise to irritation or swelling.

Nuclein Solution, No. 2, 5%, for oral use only.—This solution is not so completely freed from albuminous matter as is necessary for hypodermic use, and therefore must *only be given orally*. The oral dose *for horses and cattle* is from 1 to 2 fl. ounces three times a day; *for dogs*, 2 minims per pound of body-weight, in a little milk every three or four hours.

Nuclein Capsules.—Each capsule contains 2 grains of dry nucleinic acid from yeast. This form is convenient for dog practice; 1 to 2 capsules half an hour before food is the usual dose.

Clinical Reports.

At a meeting of the South Durham and North Yorkshire Veterinary Medical Association, Mr. Peele stated that he had obtained excellent results in **pneumonia** from the use of Nuclein without any other medicine. Mr. Forbes also bore testimony to the good effects of Nuclein in this disease; in his experience it had been invaluable in reducing the temperature. (*Veterinary Record*, December 16, 1911.)

An F.R.C.V.S. reports a case of **double pneumonia** in a foal four months old. Temperature 105·5°. No drenches were given, but 2·5 c.c. of 5% Nuclein Solution were injected intramuscularly twice daily with excellent results after six doses. (*Veterinary Notes*, London, January, 1916.)

A prominent veterinary surgeon in Scotland informs us that in his opinion Nuclein is of no use in the treatment of **pneumonia in dogs and cats** until consolidation has taken place, but that if injections of Nuclein are then given, failure is almost impossible.

In the course of a paper on **equine influenza** read before tha Lancashire Veterinary Medical Association, Prof. Wooldridge dealt very fully with the treatment of this condition. He advised that hypo-

dermic injections of Nuclein (4 drachms) should be administered daily, in addition to 3 or 4 ounces of Epsom salt in the drinking water. (*Veterinary Record*, July 25, 1914.)

Mr. Eve reports in *Veterinary News*, April 13, 1912, the successful treatment of a case of **catarrhal influenza** (pink-eye) by hypodermic injections of Nuclein (P., D. & Co.) and Sodium Chloride Solution.

Prof. Wooldridge stated that half an ounce of Nuclein given hypodermically is very good in **purpura hæmorrhagica** in horses. (*Veterinary Record*, March 14, 1914.)

Mr. Wallis corroborated but preferred to give the Nuclein orally in milk. (*Ibid.*)

A paper read at the Annual Meeting of the Scottish Metropolitan Veterinary Medical Society (see *Veterinary Record*, March 11, 1911, page 589) described the good effects of Nuclein in some particularly severe cases of **strangles, pneumonia, influenza and purpura hæmorrhagica.** The author stated that in bad cases he administered tonics in addition to the Nuclein. In the subsequent discussion several veterinarians reported successful use of Nuclein in **purpura hæmorrhagica, acute synovitis, and pyæmic arthritis.**

Mr. Peddie contributes to the *Veterinary Journal* for December, 1910, detailed reports of the use of Nuclein (P., D. & Co.) in the treatment of **canine distemper.** His usual practice was to give the drug hypodermically for the first three days, then to give it by the mouth. In his concluding remarks he states : " I have, in all, treated thirty-two cases of distemper with the aid of Nuclein, and have had only four deaths, a percentage of recoveries I could not have hoped for with the treatment previously adopted."

At a meeting of the Lancashire Veterinary Medical Association, held on September 7, 1911, Mr. Stent said that he had recently treated a Great Dane suffering from **severe distemper** ; he injected 4 c.c. of 5% Solution of Nuclein, and the following day hæmorrhage ceased ; two days later the appetite returned and the animal recovered splendidly.

Mr. Masson reported that he had had wonderful results in **Stuttgart disease** by giving large doses of Nuclein daily. (*Veterinary Record*, March 1, 1924.)

Mr. Hill states that he has found Nuclein very excellent in **navel-ill** in foals. In one case, the foal had bad abscesses, an open urachus, and was so weak that it had to be lifted up, yet a good recovery was brought about. He had also used it with good effect in **canine distemper** and **follicular mange.** (*Veterinary Record*, December 16, 1911.)

In *Veterinary News* for February 4, 1911 (page 67), a report is published of a case of **poll-evil** which appeared so hopeless after a month of treatment that the surgeon writes : " I thought the best dose would be one of lead." As an experiment Nuclein was adopted, " and to my surprise on the sixth or seventh day I saw some improvement." A perfect recovery resulted. The same article contains notes on a very

grave case of **fistula** in which septicæmia of the withers had developed and two of the spinous processes were diseased and had to be excised. The animal was treated for a month without any improvement, whereupon Nuclein was given, and thenceforward there was gradual progress to complete recovery.

Prof. Wooldridge reports in the *Veterinary Journal* for July, 1911, a case of **pyæmia** in a dog which " presented a very miserable spectacle." A week of ordinary treatment having produced little if any improvement, Nuclein Solution (P., D. & Co.) was given subcutaneously and " from that time the improvement was very manifest." Prof. Woolridge remarks : " In this case the commencement of recovery was obviously coincidental with the administration of the Nuclein, and I have no hesitation in attributing the success of the case largely to its assistance. I have now used Nuclein in canine practice in a very large number of cases, and regard it as a very valuable adjuvant to our other medicinal agents. I recommend it in most **catarrhal affections,** whether contagious or not, to be used not as a substitute for other lines of treatment, but in addition to them. I have had far better results when given hypodermically than when given *per os.*"

In an article on **bovine mastitis,** Mr. Harvey stated that it is advantageous to give Nuclein hypodermically as soon as symptoms are detected. (*Veterinary Record,* September 9, 1922.)

'OCULETS' (P., D. & Co.).

' Oculets ' are extremely thin and readily soluble discs containing accurate doses of specially pure drugs for ophthalmic medication. They are made under the strictest precautions with respect to purity, asepticity, accuracy, and freedom from foreign matter that might provoke irritation.

The ' Oculet ' is introduced into the conjunctival sac by drawing forward the lower eyelid, and in a few seconds it is dissolved by the lachrymal secretion, the characteristic action of the drug being at once obtained.

It is well known that several of the drugs employed in ophthalmic medication are very liable to deteriorate when in solution, hence there is a great advantage in having a single dose so presented as to be always active and capable of being administered without that element of uncertainty which attaches to the instillation of drops. Of course, if it should be preferred, one or two ' Oculets ' may be dissolved in distilled water for use as a collyrium. For list see next page.

List No.

'Oculets' are supplied in tubes of 25, except those marked with an asterisk, which are in tubes of 12.

1.* **Adrenalin, 1/200 grain.**

Constringent, ischæmic. Quickly reduces hyperæmia. Valuable in conjunctivitis, iritis, glaucoma, keratitis, and as an aid to diagnosis. Also used prior to operations to render the part free from blood.

2. **Atropine Sulphate, 1/200 grain.**

A powerful mydriatic. Employed in ophthalmoscopic examinations, to break down adhesions, etc.

3.● **Atropine and Cocaine.**

Atropine Sulphate	$\frac{1}{200}$ gr.
Cocaine Hydrochloride	$\frac{1}{100}$ gr.

The simultaneous use of cocaine hastens the mydriatic action of atropine and prevents irritation, and is particularly useful in inflammatory conditions.

4.●* **Cocaine Hydrochloride, 1/20 grain.**

Employed to relieve painful conditions or to prevent pain during examinations, operations, and the removal of foreign bodies. Produces mydriasis with partial paralysis of accommodation.

5. **Corrosive Sublimate, 1/100,000 grain.**

Antiseptic. Used in various forms of ophthalmia, and particularly in those of bacterial origin.

Dionin, see "Ethylmorphine Hydrochloride."

Eserine, see "Physostigmine."

6. **Ethylmorphine Hydrochloride, 1/125 grain.**

An analgesic which may be employed when cocaine is contra-indicated, as it does not dilate the pupil or increase tension. Much used to relieve the pain of glaucoma, iritis, keratitis, etc. Is very effective in clearing up corneal opacities.

7.* **Fluoresceïn, 1/250 grain.**

Used in the diagnosis of corneal lesions; normal parts are unaffected, but a green colour is imparted to ulcers and parts denuded of epithelium, whilst loss of substance in the conjunctiva is shown by a yellow appearance.

8.* **Homatropine Hydrochloride, 1/40 grain.**

Produces mydriasis more rapidly than atropine, and its effect passes off much sooner.

9.●* **Homatropine and Cocaine.**

Homatropine Hydrochloride	$\frac{1}{250}$ gr.
Cocaine Hydrochloride	$\frac{1}{50}$ gr.

The simultaneous use of cocaine hastens the mydriatic effect of homatropine and increases its intensity, whilst preventing irritation.

16.●* **Homatropine and Cocaine, ℞ 'B.'**

Homatropine Hydrochloride	$\frac{1}{50}$ gr.
Cocaine Hydrochloride	$\frac{1}{50}$ gr.

The larger proportion of homatropine may cause this combination to be preferred to No. 9 in certain cases.

Mallein, see page 35.

Mercuric Chloride, see "Corrosive Sublimate."

11. **Physostigmine Salicylate, 1/600 grain.**

Physostigmine (eserine) is a powerful myotic, used in glaucoma, ciliary paralysis, etc., also with (or subsequent to) atropine or homatropine to lessen (or counteract) their mydriatic effect.

In ordering, please quote number as well as title.

● Subject to Dangerous Drugs Regulations.

No.

12. ●**Pilocarpine and Cocaine.**

Pilocarpine Nitrate	$\frac{1}{300}$ gr.
Cocaine Hydrochloride	$\frac{1}{200}$ gr.

Pilocarpine contracts the pupil and relieves intra-ocular pressure; but its action in these respects is not so persistent as that of physostigmine. Employed in glaucoma and intra-ocular hæmorrhage. The simultaneous use of cocaine prevents irritation.

13. **Zinc Sulphate, 1/250 grain.**
Astringent; employed in acute or chronic conjunctivitis.

14. ●**Zinc and Cocaine.**

Zinc Sulphate	$\frac{1}{250}$ gr.
Cocaine Hydrochloride	$\frac{1}{25}$ gr.

The simultaneous use of cocaine permits the employment of the zinc salt in highly sensitive conditions.

15. ●**Zinc and Opium.**

Zinc Sulphate	$\frac{1}{250}$ gr.
Opium	$\frac{1}{250}$ gr.

In this combination the opium provides a soothing effect, counteracting the irritating tendency of the zinc salt, though not so powerfully, of course, as the cocaine in the preceding formula.

PILLS (P., D. & Co.).

Pills of our manufacture are prepared from the very highest quality of drugs and are coated by a method which avoids the application of a degree of heat which might impair their efficacy. To some we give a coating of gelatin, whilst others receive a coating of sugar; these coatings are readily soluble in the digestive fluids. Pills which contain medicaments whose action is required in the intestine are protected from solution in the gastric juice by a special coating.

Oviform gelatin-coated pills are supplied unless otherwise specified, excepting those of B.P. formulæ, which are round and sugar-coated. The oviform pill is more easily swallowed, more readily acted upon by the gastric juice, and more rapidly disintegrated than a round pill.

No.

716. **Aloes, B.P., 4 grains.**

Alophen.

Aloin	$\frac{1}{4}$ grain
Phenolphthalein	$\frac{1}{2}$ grain
Ipecacuanha	$\frac{1}{15}$ grain
Strychnine	$\frac{1}{80}$ grain
Extract of Belladonna	$\frac{1}{12}$ grain

In ordering, please quote number as well as title.

● Subject to Dangerous Drugs Regulations.

No.

52. **Anti-Dyspeptic.**

Mass of Mercury (Blue Mass)	2 grains
Ext. Colocynth Comp.	2 grains
Ext. Belladonna	$\frac{1}{10}$ grain
Powdered Ipecacuanha	$\frac{1}{10}$ grain
Strychnine	$\frac{1}{40}$ grain

163. **Cathartic Compound, U.S.P.**

Ext. Colocynth Comp.	1 $\frac{1}{4}$ grains
Calomel	1 grain
Resin of Jalap	$\frac{1}{3}$ grain
Powdered Gamboge	$\frac{1}{4}$ grain

253. **Digitalis Compound.**

Powdered Digitalis	1 grain
Powdered Squill	1 grain
Potassium Nitrate	2 grains

275. **Ergotin (Bonjean), 3 grains.**

313. **Intestinal Antiseptic.**

Mercurous Iodide, Yellow	$\frac{1}{8}$ grain
Podophyllum Resin	$\frac{1}{16}$ grain
Aloin	$\frac{1}{16}$ grain
Ext. Nux Vomica	$\frac{1}{16}$ grain
Ext. Hyoscyamus	$\frac{1}{16}$ grain

363. **Laxative.**

Purified Aloes	1 grain
Sulphur, Sublimed	$\frac{1}{5}$ grain
Guaiacum	$\frac{1}{2}$ grain
Podophyllum Resin	$\frac{1}{5}$ grain
Syr. Buckthorn Berries	q.s.

477. **Phosphorus, Nux Vomica and Damiana.**

Phosphorus	$\frac{1}{100}$ grain
Ext. Nux Vomica	$\frac{1}{8}$ grain
Ext. Damiana	2 grains

This combination is useful in some cases of sterility, the dose being proportioned to the animal to be treated.

565. **Rheumatic.**

Ext. Colocynth Comp.	1 $\frac{1}{2}$ grains
Ext. Colchicum Root	1 grain
Ext. Hyoscyamus	$\frac{1}{3}$ grain
Calomel	$\frac{1}{3}$ grain

593. **Sedative.**

Ext. Sumbul	$\frac{1}{2}$ grain
Ext. Hyoscyamus	$\frac{1}{2}$ grain
Ext. Valerian	$\frac{1}{2}$ grain
Ext. Cannabis	$\frac{1}{10}$ grain

629. **Tonic.**

Quinine Sulphate	1 grain
Reduced Iron	$\frac{2}{3}$ grain
Strychnine	$\frac{1}{50}$ grain
Arsenious Acid	$\frac{1}{50}$ grain

SAW PALMETTO AND SANTAL COMPOUND ELIXIR
(P., D. & Co. No. 124).

EACH FLUID OUNCE REPRESENTS :

Saw Palmetto Berries	120 grains
Corn-Silk	120 grains
Sandalwood	30 grains

This Elixir is of great value in overcoming **vesical and urethral irritability** and in restoring the normal tone of the genito-urinary tract. It has proved an excellent auxiliary to Adrenalin in the treatment of **azoturia** (*see page* 47).

Saw Palmetto is sedative to irritated mucous membrane. Corn-Silk possesses diuretic, demulcent and antiseptic properties which are of special value in inflammatory conditions of the urinary tract. Sandalwood possesses in moderate degree the demulcent and healing properties of santal oil, and is less nauseating.

The following draught, given twice daily, has been found of great value in the after-treatment of **azoturia** and **purpura hæmorrhagica** in horses :—

Elixir Saw Palmetto and Santal Comp. (P., D. & Co.)	2 fl. ozs.
Fluid Extract Hyoscyamus, Miscible (P., D. & Co.) ..	48 mins.
Liquid Buchu (for infusion) (P., D. & Co.)	90 mins.
Distilled Water	to 16 fl. ozs.

This brings about splendid results in racehorses suffering from **kidney trouble ;** in many cases that have not responded to other drugs it has been found excellent in restoring condition.

TABLETS (P., D. & Co.).

Purity and therapeutic activity are features of "P., D. & Co." Compressed Tablets (C.T.), Chocolate-coated Tablets (C.C.T.), and Tablet Triturates (T.T.). All chemicals and extracts which enter into their composition are carefully tested by our analytical department, and every drug is standardised.

Almost all simple drugs and chemicals employed in medicine for dogs and pet animals are prepared by us in the form of Compressed Tablets in convenient doses in addition to those we mention here.

Supplied in bottles of 100, 500 and 1,000.

No.		
C.C.T. 10.	**Aloin, Belladonna and Nux Vomica.**	
	Aloin	$\frac{1}{5}$ grain
	Ext. Belladonna	$\frac{1}{8}$ grain
	Ext. Nux Vomica	$\frac{1}{6}$ grain
T.T. 220.	**Aloin, Belladonna and Podophyllin.**	
	Aloin	$\frac{1}{8}$ grain
	Ext. Belladonna	$\frac{1}{8}$ grain
	Podophyllum Resin	$\frac{1}{8}$ grain

In ordering, please quote number as well as title.

C.C.T. = Chocolate-coated Tablet ; T.T. = Tablet Triturate.

No.

Antiseptic, see page 101.

C.C.T. 416. **Aperient.**

Calomel	2 grains
Compound Pill of Colocynth	2 grains
Compound Rhubarb Pill	2 grains

C.T. 283. **Aromatic Chalk Powder with Opium, 5 grains.**
Each tablet contains $\frac{1}{8}$ grain of opium.

T.T. 4. **Arsenious Acid, $\frac{1}{20}$ grain.**
Largely employed as an alterative; beneficial also in cases of broken wind, chorea and epilepsy. Dose for dogs, $\frac{1}{60}$ to $\frac{1}{10}$ grain.

C.T. 278. **Aspirin, 5 grains.**
A valuable anti-rheumatic and antipyretic. Sometimes employed in distemper, for which purpose it may be dissolved in a little brandy and diluted with milk. Dose for puppies 3 to 9 months old, 5 to 10 grains; from 9 to 18 months, 10 to 15 grains.

C.T. 579. **Aspirin Compound with Dover Powder (Modified).**

Aspirin	6 grains
Phenacetin	2½ grains
Dover Powder	2 grains

C.T. 198.● **Astringent and Antiseptic.**

Alum	3 grains
Zinc Sulphate	2 grains
Fluid Golden-seal (Colourless)	1½ minims
Morphine Sulphate	$\frac{1}{20}$ grain
Tannic Acid	2 grains
Boric Acid	6 grains

For a douche or injection dissolve one or two tablets (as conditions require) in half a pint of tepid water. Solutions should only be prepared just before use.

C.T. 260. **Bismuth and Soda.**

Bismuth Subnitrate	2½ grains
Sodium Bicarbonate	2½ grains

T.T. 693. **Bronchitis.**

Tinct. Aconite	$\frac{3}{4}$ minim
Tinct. Bryonia	$\frac{1}{10}$ minim
Tinct. Belladonna	$\frac{1}{10}$ minim
Sulphurated Antimony	$\frac{1}{100}$ grain
Potassium Bichromate	$\frac{1}{100}$ grain

C.T. 59. **Brown Mixture.**

Ext. Glycyrrhiza	3 grains
Benzoic Acid	$\frac{1}{20}$ grain
Antimony and Potassium Tartrate	$\frac{1}{40}$ grain
Powdered Opium	$\frac{1}{20}$ grain
Camphor	$\frac{1}{20}$ grain
Oil of Anise	$\frac{1}{20}$ minim

C.T. 627. **Calobarb.**

Calomel	1 grain
Phenolphthalein	2 grains
Powdered Rhubarb	2 grains

In ordering, please quote number as well as title.

● Subject to Dangerous Drugs Regulations.
C.T. = Compressed Tablet; C.C.T. = Chocolate-coated Tablet; T.T. = Tablet Triturate.

No.

T.T. 216. **Calomel and Sodium Bicarbonate, ℞ 'A.'**

Calomel	$\frac{1}{10}$ grain
Sodium Bicarbonate	1 grain

T.T. 312. **Calomel and Sodium Bicarbonate, ℞ 'C.'**

Calomel	1 grain
Sodium Bicarbonate	1 grain

T.T. 647. **Cardiac Compound.**

Caffeine Hydrobromide	1 grain
Nitroglycerin (Glonoin)	$\frac{1}{100}$ grain
Tinct. Digitalis	2 minims
Tinct. Strophanthus (B.P. 1914)	1 minim

C.C.T. 58. **Cathartic Compound, Improved, 1 grain.**

Ext. Colocynth Comp.	$\frac{1}{8}$ grain
Ext. Jalap	$\frac{1}{6}$ grain
Podophyllum Resin	$\frac{1}{12}$ grain
Ext. Gentian	$\frac{1}{6}$ grain
Leptandrin	$\frac{1}{12}$ grain
Ext. Hyoscyamus	$\frac{1}{12}$ grain
Oil of Peppermint	q.s.

C.C.T. 409. **Cathartic Compound, Improved, 3 grains.**
Three times the strength of the preceding.

C.C.T. 59. ● **Chlorodyne.**

Morphine Hydrochloride	$\frac{1}{6}$ grain
Ext. Cannabis	$\frac{1}{4}$ grain
Nitroglycerin (Glonoin)	$\frac{1}{300}$ grain
Ext. Hyoscyamus	$\frac{1}{2}$ grain
Oleoresin of Capsicum	$\frac{1}{20}$ minim
Oil of Peppermint	$\frac{1}{10}$ minim

C.T. 474. ● **Cocaine Hydrochloride, 2-3/16 grains.**
One tablet in 1 drachm of water forms a 4% solution.
Also see " Hypodermic Tablets," page 92 ; " Oculets," page 77.

C.C.T. 71. **Cystitis, ℞ 1.**

Boric Acid	2 grains
Potassium Bicarbonate	2 grains
Ext. Buchu	1 grain
Ext. Triticum	1 grain
Ext. Zea Mays (Corn-Silk)	$\frac{1}{2}$ grain
Ext. Hydrangea	$\frac{1}{2}$ grain
Atropine Sulphate	$\frac{1}{300}$ grain

C.T. 20. **Damiana Compound.**

Ext. Damiana	2 grains
Zinc Phosphide	$\frac{1}{7}$ grain
Ext. Nux Vomica	$\frac{1}{4}$ grain

C.T. 10. **Damiana and Zinc Phosphide Compound.**

Ext. Damiana	2 grains
Ext. Nux Vomica	$\frac{1}{8}$ grain
Zinc Phosphide	$\frac{1}{10}$ grain
Cantharides	$\frac{1}{25}$ grain

In ordering, please quote number as well as title.

● Subject to Dangerous Drugs Regulations.

C.T. = Compressed Tablet; C.C.T. = Chocolate-coated Tablet; T.T. = Tablet Triturate.

No.

C.C.T. 77. **Digestive, ℞ 'B.'**

Pepsin, P., D. & Co. (1 : 3000)	3 grains
Diastase	¼ grain
Ext. Nux Vomica	⅛ grain
Powdered Ipecacuanha	1/12 grain

C.C.T. 80. **Diuretic.**

Powdered Digitalis	1 grain
Potassium Nitrate	1 grain
Ext. Buchu	1 grain
Powdered Squill	1 grain

T.T. 68. **Dover Powder (Ipecacuanha and Opium Powder), 1 grain.**

Useful in the treatment of the intestinal form of canine distemper, also of catarrhal affections, dysentery, etc. Dose, 1 to 5 tablets, or more for large dogs.

C.T. 263. **Easton Syrup, 1 drachm** (*sugar-coated*).

Iron Phosphate (soluble)	1 grain
Quinine Phosphate	¾ grain
Strychnine Phosphate	1/32 grain

C.T. 25. **Ergotin Compound.**

Ergotin (Bonjean)	1½ grains
Tinct. Digitalis	½ minim
Quinine Sulphate	½ grain

C.T. 55. **Euphorbia Compound (Anti-Asthmatic).**

Fl. Ext. Euphorbia Pilulifera	3 minims
Potassium Iodide	2 grains
Sodium Bromide	2 grains
Nitroglycerin (Glonoin)	1/200 grain
Tinct. Lobelia (1 in 10)	4 minims

C.T. 499. **Hexamine, 5 grains.**

Hexamine (hexamethylenetetramine) is a valuable urinary disinfectant. Dose for a dog, 3 to 5 grains, dissolved in at least 5 ounces of water.

These tablets, when ignited, evolve a high degree of heat, and are useful for emergency sterilisation of hypodermic needles, water, etc. The tablet should be placed on a coin or other fireproof surface and a lighted match applied.

C.T. 27. **Hypophosphites and Quinine Compound** (*sugar-coated*).

Quinine Hypophosphite	1 grain
Ferric Hypophosphite	½ grain
Calcium Hypophosphite	½ grain
Sodium Hypophosphite	¼ grain
Potassium Hypophosphite	¼ grain
Manganese Hypophosphite	¼ grain

T.T. 415. **Iron and Arsenic, ℞ 'C.'**

Reduced Iron	1 grain
Arsenious Acid	1/30 grain

C.C.T. 94. **Iron, Quinine and Strychnine.**

Reduced Iron	½ grain
Quinine Sulphate	½ grain
Strychnine Sulphate	1/120 grain

In ordering, please quote number as well as title.

C.T. = Compressed Tablet; C.C.T. = Chocolate-coated Tablet; T.T. = Tablet Triturate.

No.

C.T. 475. ●**Lead and Opium, for Lotion.**

Lead Acetate	5 grains
Ext. Opium	1 grain

One tablet dissolved in 5 ounces of warm water forms an anodyne and astringent lotion ; beneficial in inflammatory conditions, sprains, œdema, etc.

C.T. 492. **Lead Subacetate, 10 grains.**

The solution of one tablet in 5 ounces of distilled water contains about the same percentage of lead subacetate as does the B.P. diluted solution (Goulard's lotion). This may be used as a soothing and astringent application in eczema, hæmorrhoids, skin inflammations and irritations, etc. If a mixture of 2 ounces of Distilled Extract of Witch Hazel (P., D. & Co.) and 3 ounces of distilled water be used as the solvent, the cooling and soothing properties will be enhanced. One tablet in 6 ounces of distilled water is suitable for a vaginal injection. The same strength may be used as a collyrium in granular conjunctivitis and ophthalmia if ulceration is not present.

Mercuric Chloride, see Antiseptic Tablets, page 101.

Mercuric Iodide, see page 112.

C.T. 34. **Nasoral.**

Sodium Bicarbonate	5 grains
Sodium Biborate	5 grains
Sodium Chloride	5 grains
Sodium Benzoate	$\frac{7}{24}$ grain
Sodium Salicylate	$\frac{7}{24}$ grain
Oil of Eucalyptus	$\frac{7}{48}$ minim
Thymol	$\frac{7}{48}$ grain
Menthol	$\frac{7}{96}$ grain
Oil of Wintergreen, synthetic	$\frac{7}{96}$ minim

For an alkaline and antiseptic douche or spray one tablet should be powdered and dissolved in 2, $2\frac{1}{2}$ or 4 ounces of tepid water, according as a hypertonic, isotonic, or hypotonic action is desired.

C.T. 466. **Nasal Compound with Phenol.**

Sodium Bicarbonate	6 grains
Sodium Biborate	3 grains
Phenol	1 grain
White Sugar	1 grain

For an alkaline and antiseptic spray or douche dissolve one tablet in 1 ounce of tepid water.

C.C.T. 479. **Nucleo-Proteid Compound.**

Potassium Glycerophosphate	1 grain
Calcium Glycerophosphate	1 grain
Lecithin	$\frac{1}{2}$ grain
Nuclein	$\frac{1}{4}$ grain

A tonic-nutrient and reconstituent, valuable in all disorders depending upon impaired nutrition, also whenever it is desired to stimulate the disease-resisting powers of the animal. Dose for a dog, 1 tablet thrice daily, preferably preceded by a little food.

C.T. 72. **Pepsin, Bismuth and Charcoal.**

Pepsin, P., D. & Co. (1 : 3000)	2 grains
Bismuth Subnitrate	2 grains
Charcoal	2 grains

In ordering, please quote number as well as title.

● Subject to Dangerous Drugs Regulations.
C.T. = Compressed Tablet ; C.C.T. = Chocolate-coated Tablet.

No.

T.T. 689. **Potassium Arsenite Sol. (Fowler Solution), 1 minim.**

C.T. 119. **Potassium Iodide, 5 grains.**

C.T. 120. **Potassium Permanganate, 2 grains.**

Disinfectant, deodorant, antiseptic. For sloughing ulcers, abscesses, infected wounds, etc., irrigation with, followed by cold compresses of, a solution of 75 grains in 1 pint of water may be used. For a uterine douche after difficult parturition, or in retention of the fœtal membranes, 15 grains in 1 quart of water will be suitable. As a caustic application to ulcers, etc., a tablet may be crushed and dusted over the surface. For deodorising drains, etc., a solution of 80 grains to each pint of water should be used.

The intravenous injection of from 3 to 15 drachms of a 0·3% solution (2 grains in 12 drachms of sterile water) has been reported curative of tetanus. (*Rec. Méd. Vét.*, June 30, 1917).

C.T. 94. **Quinine Sulphate, 1 grain** (*sugar-coated*).

Also various other strengths.

C.C.T. 177. **Rheumatism.**

Sodium Salicylate	5 grains
Colchicine	$\frac{1}{120}$ grain
Codeine Sulphate	$\frac{1}{16}$ grain

C.T. 41. **Salol, 5 grains.**

T.T. 156. **Santonin and Calomel.**

Santonin	$\frac{1}{2}$ grain
Calomel	$\frac{1}{2}$ grain

C.T. 493. **Silver Nitrate, 1 grain.**

For an eye lotion dissolve one tablet in 3 to 8 drachms of distilled water; for urethral or vaginal injection, one tablet in from 1 to 10 ounces of distilled water; for application to ulcers or indolent wounds, three tablets in 1 to 3 drachms of distilled water. As a lotion for eczema, three tablets may be dissolved in 1 drachm of spirit of nitrous ether.

C.T. 365. **Sodium Chloride, 15¾ grains.**

To prepare physiological salt solution for intravenous or rectal injections, or for diluting Adrenalin Chloride Solution, dissolve one tablet in 4 ounces of distilled water, and boil the solution for five minutes in a flask, the neck of which is loosely plugged with cotton wool. This solution, which is also known as Normal Saline Solution, contains 0·9% of sodium chloride, and is isotonic with the blood plasma.

T.T. 161. **Strychnine Sulphate, $\frac{1}{60}$ grain.**

Also various other strengths.

C.T. 116. **Sulphur Compound.**

Sublimed Sulphur	5 grains
Ext. Ipecacuanha	$\frac{1}{100}$ grain
Ext. Capsicum	$\frac{1}{500}$ grain
Potassium Bitartrate	2 grains
Arsenious Acid	$\frac{1}{1000}$ grain
Sodium Benzoate	$\frac{1}{16}$ grain

Taka-Diastase, see page 88.

C.C.T. 215. ● **Terpin Hydrate and Diamorphine.**

Terpin Hydrate	2 grains
Diamorphine	$\frac{1}{50}$ grain

Very effective in the bronchial affections of dogs.

In ordering, please quote number as well as title.

● Subject to Dangerous Drugs Regulations.

C.T. = Compressed Tablet; C. C.T. = Chocolate-coated Tablet; T.T. = Tablet Triturate.

No.

C.C.T. 383. ● **Terpin Hydrate and Diamorphine Co.**

Terpin Hydrate	2 grains
Diamorphine	$\frac{1}{16}$ grain
Beechwood Creosote	1 minim
Strychnine Sulphate	$\frac{1}{60}$ grain
Eucalyptol	$\frac{1}{2}$ minim

Thyroid Gland.

Tablets are supplied in the following strengths:—$\frac{1}{4}$, $\frac{1}{2}$, 1, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, 5 and 10 grains.

C.C.T. 408. **Triple Glycerophosphates with Nuclein.**

Sodium Glycerophosphate	1 grain
Calcium Glycerophosphate	1 grain
Iron Glycerophosphate	1 grain
Nuclein	$\frac{1}{2}$ grain

These tablets are particularly valuable for giving to dogs when ailing and apparently sickening for distemper. Also suitable for administration during an attack of distemper or pneumonia. Dose for dogs, 1 tablet twice or thrice daily.

C.T. 575. **Trypan Blue, $2\frac{3}{10}$ grains (0.15 gm.).**

2 tablets dissolved in 30 c.c. (1 fl. oz.) of sterile water make a 1% solution.

Used by subcutaneous or, preferably, intravenous injection in the treatment of piroplasmosis (biliary fever or malignant jaundice in the dog, and redwater or Texas fever in cattle). Encouraging results in the prophylaxis and treatment of foot and mouth disease by injection of the 1% solution are reported by Davidson in the *Veterinary Journal*, March, 1924. The solution should be made with boiling water, filtered under strict aseptic precautions and injected when sufficiently cool.

Doses of the 1% solution—For puppies up to 5 lb. in weight, $1\frac{1}{2}$ to 2 c.c. (25 to 30 mins.). For dogs up to 20 lb., 4 c.c. (1 fl. drachm); 20 to 40 lb., 8 c.c. (120 mins.); over 40 lb., 15 c.c. ($\frac{1}{2}$ oz.). For cattle, 100 to 250 c.c. ($3\frac{1}{2}$ to 9 oz.); repeated if necessary.

C.C.T. 154. **Viburnum Compound (Uterine Tonic).**

Ext. Viburnum Prunifolium	1 grain
Ext. Viburnum Opulus	1 grain
Ext. Aletris Farinosa	$\frac{1}{2}$ grain
Ext. Helonias	$\frac{1}{2}$ grain
Ext. Mitchella Repens	$\frac{1}{2}$ grain
Caulophyllin	$\frac{1}{4}$ grain

C.T. 287. **Zinc Sulphate, 5 grains.**

For an astringent vaginal or urethral injection or for application to ulcers, dissolve one tablet in from 2 to 5 ounces of water, as may be indicated. The solution of one tablet in 5 ounces of distilled water is used as a collyrium in acute or chronic conjunctivitis; two grains of Chloretone may be added to lessen irritating effects.

C.T. 52. **Zinc Sulphocarbolate, 5 grains.**

The solution of one tablet in from 2 to 6 ounces of water is suitable for use as an astringent and antiseptic injection or nasal douche. For use as a throat spray, one tablet may be dissolved in 1 ounce of water.

In ordering, please quote number as well as title.

● Subject to Dangerous Drugs Regulations.
C.T. = Compressed Tablet; C.C.T. = Chocolate-coated Tablet.

TAKA-DIASTASE.

Taka-Diastase is a ferment, in powder form, of great value in the treatment of amylaceous dyspepsia. It possesses greater amylolytic power than any other form of diastase, and under proper conditions it will render soluble 300 times its weight of *dry* starch in ten minutes, while the best malt extract will not convert one-tenth of that amount in half an hour. We are informed that in Japan, veterinarians have had great success in the treatment of acute indigestion in **racehorses** —one of the most troublesome conditions with which the owners of racing stock have to contend—by administering Liquid Taka-Diastase in 1-ounce doses.

An English Veterinary Surgeon writes: "Two valuable racehorses suffering from **debility** and **indigestion** were given drachm doses of Taka-Diastase thrice daily in food, and within a month their condition was so much improved that they were fit for training. The treatment was expensive, but the result fully justified the outlay."

Dogs which are petted, pampered and overfed, very frequently suffer from indigestion. Many canine ailments are due to an excess of starchy food and in such cases 1 teaspoonful of Liquid Taka-Diastase, or one 2½-grain tablet, will often prove very beneficial, used in conjunction with suitable eliminants. In some cases the addition of pepsin, pancreatin, etc., may be advantageous.

For **puppies** which do not thrive, a dose of Taka-Diastase twice or thrice daily improves assimilation and nutrition, and promotes increase in weight and vigour.

The **dose** of Taka-Diastase for dogs is 2½ grains; for cats, 1 grain. It is supplied in the following forms:

Taka-Diastase, Powder.

Taka-Diastase, Liquid.

Each fluid drachm contains 2½ grains of Taka-Diastase.

Taka-Diastase Tablets (2½ grains in each).

Taka-Diastase and Pepsin Compound Tablets.

Taka-Diastase	1 grain
Pepsin, P., D. & Co. (1 : 3000)	1 grain
Pancreatin	½ grain

Valuable in the gastric type of distemper.

Taka-Diastase Sedative Elixir.

EACH FLUID DRACHM CONTAINS:

Taka-Diastase	2½ grains
Bismuth and Sodium Tartrate	2 grains
Tinct. Nux Vomica	6 minims
Diluted Hydrocyanic Acid	1 minim
Spirit of Chloroform	10 minims

HYPODERMIC MEDICAMENTS, APPARATUS, ETC.

The administration of drugs hypodermically, intravenously, or intratracheally, offers many advantages in veterinary medication, particularly when administration by the mouth is inadvisable, as in acute abdominal pain, acute indigestion, enteritis, or impaction of the stomach or intestines, at which times, owing to inadequate absorption, little therapeutic action can be expected from oral administration.

Drugs administered **hypodermically** enter the circulation unaltered by the ferments or secretions of the digestive canal; this method, therefore, gives prompt and reliable effects. Except in emergency cases, it is best to give a small dose for the first injection.

Intravenous injection introduces the drug through the jugular vein directly into the blood stream. Solutions for this purpose should be diluted until non-irritant, the best diluent being a solution of one Compressed Tablet Sodium Chloride (*see page* 86), or 15¾ grains of pure sodium chloride, in four ounces of tepid recently-boiled water. The injection should be made *slowly*, taking every precaution against clot formation, septic contamination, or the introduction of air. It should be stated, however, that the intravenous method entails some risk of phlebitis, embolism or thrombosis, and it is probable that equally good results may usually be obtained from subcutaneous administration.

Whichever method is used, **every antiseptic precaution should be observed.** The hair over the site of injection should be cut close or shaved, the part cleansed with Germicidal Soap (*see page* 109), and the needle rendered sterile.

In order to guard against the contamination and deterioration to which solutions kept in stock bottles are very liable, it is desirable to employ the Sterilised Solutions for Hypodermic Injection supplied in 'Glaseptic' Ampoules, or else a freshly-prepared solution of the 'P., D. & Co.' Hypodermic Tablet in saline solution or recently-boiled distilled water.

'GLASEPTIC' AMPOULES OF STERILISED SOLUTIONS FOR HYPODERMIC INJECTION.

'The P., D. & Co.' Sterilised Solutions in 'Glaseptic' Ampoules provide the veterinary surgeon with a series of reliable medicaments for hypodermic administration in containers which afford the maximum of convenience in portability and readiness for use, and which

also ensure absolute reliability in the medicinal strength of the injection as well as freedom from bacterial or other contamination.

The mode of transferring the fluid from the ampoule to the syringe is as follows:

(1) Sterilise the hypodermic syringe and needle.
(2) Shake the liquid out of the tip of the ampoule in much the same manner that one would shake down the column of mercury in a clinical thermometer.
(3) With a small file make a nick on the tip of the ampoule (about half an inch from the shoulder) and break off the extremity.
(4) Hold the ampoule, inverted, between the thumb and index finger of the left hand; the contents will not escape.
(5) Insert the needle of the syringe into the open neck of the ampoule, carrying the point about halfway up the side of the shoulder (far enough to allow air to pass the needle into the ampoule).
(6) Grasp the barrel of the syringe between the palm and the third and fourth fingers of the left hand and withdraw the piston of the syringe with the right hand.
(7) Still holding the syringe needle upward, gently press home the piston until the air is expelled from the barrel and needle.

The following selection of Solutions supplied in 'Glaseptic' Ampoules includes those most useful to veterinary surgeons.

Adrenalin Chloride Solution, 1 in 1000.

In ampoules containing 0·5 c.c.
For notes on this preparation, see page 44.

Adrenalin Chloride Solution, 1 in 10,000.

In ampoules containing 1 c.c.

Camphor in Oil.

Supplied in ampoules of two sizes, viz., 1 c.c. containing 3 grains of camphor dissolved in pure olive oil, and 10 c.c. containing 36 grains of camphor dissolved in pure olive oil.

Camphor is a diffusible heart stimulant and nerve sedative; it is administered hypodermically in cases of **shock, pneumonia, tuberculosis, septicæmia, etc.** An injection of 36 grains is stated to be very effective in counteracting shock after foaling or calving. Kowalewsky reports several cases of **piroplasmosis** in the horse successfully treated by administering quinine internally and camphor in oil subcutaneously. In general and localised **rheumatism** in horses and cattle Borghesi has had good results from the injection of 35 grains of camphor (dissolved in a mixture of oil and ether) in some place where the skin is thin and loose, on three or four successive days.

Camphor injections are said to be of marked value in **joint-ill,** particularly when there is evidence of septicæmia (*Veterinary Record*, September 4, 1915, p. 111).

The injection of camphor in oil as a cardiac tonic is reported to have reduced the mortality in cases of **foot and mouth disease** (*Bulletin de la Soc. de Pathol.*, November 10, 1920).

Excellent results have been reported from the subcutaneous and intravenous injection of camphor in oil in cases of tetanus in horses (*Veterinary Record*, May 12, 1917).

We have been informed that the administration of 36 grains of camphor dissolved in 10 c.c. of oil, repeated if necessary in three hours, has been found of great value in the treatment of **milk fever** in cows.

●**'Codrenine.'**

In ampoules containing 0·5 c.c.

'Codrenine' is a combination of cocaine and adrenalin for the production of local anæsthesia and ischæmia (*see page* 125).

Ergot Aseptic.

In ampoules containing 1 c.c.

For notes on this physiologically standardised preparation of ergot, specially adapted for hypodermic administration, see page 62.

Hyoscine, see "Scopolamine."

●**Morphine Sulphate.**

In ampoules (1 c.c.) containing either $\frac{1}{4}$ or $\frac{1}{2}$ grain or morphine sulphate in sterile aqueous solution.

Dose (hypodermically) for a dog, $\frac{1}{20}$ to $\frac{1}{4}$ grain; for a horse, 2 to 4 grains; for cattle, 3 to 6 grains.

●**Morphine and Atropine.**

In ampoules (1 c.c.) containing $\frac{1}{4}$ grain of morphine sulphate with $\frac{1}{150}$ grain of atropine sulphate in sterile aqueous solution.

The association of atropine with morphine counteracts the constipating tendency of the latter drug. The combination is often beneficial in cases of **flatulent colic**; it does not, of course, do away with the necessity for evacuating the bowels (*see* "Physostigmine and Pilocarpine," *page* 97).

Nuclein Solution, 10%, Veterinary.

In ampoules containing 5 c.c.

For notes on this preparation, see page 74.

Pituitrin.

In ampoules containing 0·5 c.c. or 1 c.c.

For notes on this preparation of the posterior lobe of the pituitary gland, see page 51.

Quinine and Urea Hydrochloride.

In ampoules containing 5 c.c. of 1% solution.

For notes on the use of this preparation as a **local anæsthetic** prior to surgical operations, see page 127.

●**Scopolamine (Hyoscine) and Morphine.**

In ampoules (1 c.c.) containing $\frac{1}{170}$ grain of scopolamine (hyoscine) hydrobromide and $\frac{1}{6}$ grain of morphine hydrobromide.

An anodyne and narcotic combination suitable for injection prior to operations under local anæsthesia, in order to obviate restiveness, also prior to a general anæsthetic, since it allows of obtaining satisfactory anæsthesia with less ether or chloroform than would otherwise be necessary.

Also see "Scopolamine and Morphine Hypodermic Tablets," page 97.

Sodium Cacodylate.

In ampoules (1 c.c.) containing 3 grains or $\frac{3}{4}$ grain of sodium cacodylate in sterile aqueous solution.

Sodium cacodylate (sodium dimethylarsinate), being an organic compound, liberates its arsenic more slowly than inorganic combinations do, and it may therefore be given in larger doses, but with careful supervision for possible cumulative effects. Mr. Dean reports the cure of three cases of **infectious anæmia** in horses (in which disease, he says, the oral administration of arsenic is useless) under treatment with Sodium Cacodylate in 20-grain doses daily for seven days, then 10 grains on five successive days, then 10 grains every third day, after which an interval of ten days was allowed; then 3-grain

doses were given every third day for three doses. During the first week of treatment, 10 c.c. of Nuclein Solution were given intravenously each day (*Veterinary Notes*, Detroit, December, 1912).

Sodium Cacodylate has also been reported to be exceptionally effective in **pneumonia** of horses and dogs, causing the temperature to fall to normal within forty-eight hours without any other treatment, and rarely needing more than one dose.

The administration of Sodium Cacodylate is also beneficial in **chronic rheumatism, chronic skin diseases, anæmia, hæmorrhagic septicæmia,** in **canine typhus** and in cases of **strangles** if given at the outset.

Strychnine Sulphate.

In ampoules (0·5 c.c.) containing $\frac{1}{100}$, $\frac{1}{60}$ or $\frac{1}{30}$ grain of strychnine sulphate in sterile aqueous solution.

Small doses of strychnine are stimulating and tonic, especially to the nervous system. The drug is employed in general or partial **paralysis**, in **impotence,** and in **debilitated conditions** in general. Intratracheal injection of strychnine is reported to improve broken wind (*Veterinary Journal*, November, 1924). The effect of the drug is cumulative, therefore cautious supervision is requisite; dogs are particularly susceptible. Dose (hypodermically) for a dog, $\frac{1}{100}$ to $\frac{1}{60}$ grain; for horses and cattle, $\frac{1}{4}$ to 1 grain.

Veratrone.

In ampoules containing 0·5 c.c. or 1 c.c.

Veratrone is an aseptic non-irritating solution of the active principles of veratrum viride, specially prepared for hypodermic administration. It is a powerful arterial and spinal depressant, diaphoretic and febrifuge. It is employed in **eclampsia** and acute fevers.

Dose (hypodermically) for a dog, 2 to 4 minims; for cattle and horses, 2 to 4 c.c.

HYPODERMIC TABLETS (P., D. & Co.).

For the extemporaneous preparation of solutions of pure drugs in accurate doses for hypodermic administration.

'P., D. & Co.' Hypodermic Tablets are made under the most favourable conditions for excluding impurities. Every ingredient employed is of guaranteed purity, and the greatest care is exercised to ensure accuracy, perfect solubility and stability. Thanks to the compactness of these tablets, the veterinary surgeon can carry in his pocket a selection of drugs adapted for almost every emergency, in a case which is of little weight or bulk, and is strong enough to preclude all risk of breakage (*see page* 100).

The following selection of hypodermic tablets includes those in most frequent use in veterinary practice. It will be seen that there are two sets of distinguishing initials preceding the "List Number," viz., V.H.T. and H.T. The V.H.T. series are supplied in tubes containing 12 tablets (except in the case of Nuclein, of which the tubes only contain 10 tablets). The H.T. series present smaller doses of the respective drugs, which, though prepared originally for human medication, are suitable for use in the treatment of dogs, cats and other small animals, and in this series the tubes contain 25 tablets.

In ordering any of these hypodermic tablets, it will be sufficient merely to quote the "List Number" with its distinguishing initials.

List Number.

H.T. 1. **Aconitine (crystalline), 1/400 grain** (standardised physiologically).

V.H.T. 501. **Aconitine (crystalline), 1/60 grain** (standardised physiologically).

A powerful sedative, febrifuge, diaphoretic, diuretic and narcotic. Early doses are specially useful in sthenic fevers and acute inflammation, as pleurisy, peritonitis, pneumonia, enteritis, lymphangitis, laminitis, mammitis, etc. Its extreme toxicity demands caution in use. It is contra-indicated in cardiac affections. Dose for horses and cattle, $\frac{1}{20}$ to $\frac{1}{10}$ grain, administered with caution.

NOTE.—*Substances exhibiting great difference in characteristics and therapeutic activity are offered under the name of Aconitine; we employ a crystallised aconitine which is about six hundred times stronger than good aconite root.*

H.T. **Adrenalin, 0·001 gramme (1/65 grain).**

One tablet dissolved in 1 c.c. (17 minims) of distilled water forms a 1 : 1000 solution (*see notes on page* 44).

H.T. **Adrenalin, No. 2, 1/200 grain.**

One tablet dissolved in 5 minims of distilled water forms a 1 : 1000 solution (*see notes on page* 44).

Also see "Cocaine with Adrenalin," page 125.

H.T. 33. **Apomorphine Hydrochloride, 1/20 grain.**

H.T. 2. **Apomorphine Hydrochloride, 1/10 grain.**

Apomorphine is a sure and prompt emetic for dogs, in doses of $\frac{1}{20}$ to $\frac{1}{10}$ grain. In acute bronchitis of dogs, mild emetic doses are useful in the first stage and also in the later stage to expel indurated mucus; and in chronic dry bronchitis, doses of $\frac{1}{40}$ to $\frac{1}{25}$ grain render the secretions less viscid. For the relief of "choking" in horses, $\frac{3}{4}$ grain of apomorphine, given hypodermically, is stated to be very effective. The drug is reported to be curative of pica, cattle being given 2 grains on three successive days, and foals from 1 to 3 grains every 4 or 6 days.

Apothesine, see page 121.

V.H.T. 525. **Arecoline Hydrobromide, 1/2 grain.**

V.H.T. 526. **Arecoline Hydrobromide, 1 grain.**

A powerful sialagogue, diaphoretic, intestinal stimulant and vermifuge. It promotes peristalsis and hastens evacuation of the intestinal contents. Its action is somewhat allied to that of pilocarpine but is of shorter duration. It is valuable in the treatment of **acute indigestion, impaction, laminitis, azoturia** and **tympanites,** but is said to be contra-indicated in gastric flatulence. Dose for a dog, $\frac{1}{100}$ grain; for horses and cattle, $\frac{1}{2}$ to 2 grains in 60 to 90 minims of water.

A writer in the *Veterinary Record* (May, 1916) states that in cases of **bowel impaction** a purgative and a sedative should be given prior to the arecoline. As he finds the drug increases the respiration rate, he advises the simultaneous administration of strychnine. In cases of colic he gives $\frac{1}{2}$ grain of arecoline and $\frac{1}{2}$ grain of strychnine, and if relief is not complete in 30 minutes he gives 1 grain of arecoline alone.

Mr. Ellis recommends that in cases of **azoturia** $\frac{1}{2}$ grain of arecoline should be given to reduce plethora, and followed by an Aloetic Physic Ball (P., D. & Co.). Ten hours later he gives another $\frac{1}{2}$ grain of arecoline, and then follows on with the customary Adrenalin treatment (*Veterinary Notes*, London, January, 1916).

In the *Veterinary Record* of November 30, 1912, it is stated that 1-grain doses of arecoline, given daily for three or four days, seldom fail to cure **laminitis.**

List Number.

In the *Veterinary Record* of February 6, 1909, page 518, five cases are reported of foreign bodies in the œsophagus (horses and cows) which could not be moved manually or by probing, but which descended into the stomach after the hypodermic injection of 1½ grains of arecoline hydrobromide dissolved in 150 minims of water.

Mr. W. Gardner recommends, in cases of **azoturia,** the subcutaneous administration of 1-grain doses of arecoline hydrobromide, followed by 2 drachms of adrenalin chloride solution (1 in 1000) injected deeply into the muscles of the back twice daily (*Veterinary Record*, March 21, 1925).

Captain Wright states that in cases of **hæmoglobinuria** his first care is to give ½ grain of arecoline hypodermically (*Veterinary Record*, February 28, 1925).

Pollock considers that arecoline is more likely to be effective if a purgative has first been given. He thinks ½ grain of arecoline is too little; he gives 1 grain for a dose and has seen no bad results from 1½ grains.

Arecoline hydrobromide, administered *orally* in aqueous solution, has been used extensively for the removal of **tapeworms** in dogs. Cameron (*Veterinary Record*, October 24, 1925) states that it is essential that the patient should be starved for 24 hours, preferably 36 hours. The dose varies from $\frac{1}{16}$ grain for dogs of 5–10 lbs. weight to ½ grain for dogs of 30 lbs. and over. The average terrier requires ¼ grain.

V.H.T. 552. **Arecoline Compound, R 'B.'**

Arecoline Hydrobromide	..	..	..	½ grain
Physostigmine Salicylate	..	..	..	½ grain
Strychnine Sulphate ..	..	..	..	$\frac{1}{8}$ grain

A safe, reliable and prompt remedy for flatulent colic, impaction of the cæcum, colon or rectum, in horses and cattle. Arecoline is a more effective cathartic than physostigmine, but is not so well borne: a combination of the two permits using less of the former. The simultaneous administration of strychnine counteracts the depressing action of the purgatives on the respiratory centre. Dose for horses and cattle, 1 tablet.

H.T. 45. **Atropine Sulphate, 1/200 grain.**

H.T. 43. **Atropine Sulphate, 1/60 grain.**

V.H.T. 502. **Atropine Sulphate, 1/4 grain.**

A cardiac and respiratory stimulant, anodyne, antispasmodic and mydriatic. Useful in **catarrh, pharyngitis, laryngitis, bronchitis** and **influenza.** May be injected in cases of obstruction of the œsophagus to overcome spasm and release the foreign substance (*Veterinary Record*, October 13, 1906, page 221). Dose for cattle, $\frac{1}{6}$ to ½ grain; for horses, $\frac{1}{10}$ to ¼ grain; for dogs, $\frac{1}{200}$ to $\frac{1}{100}$ grain.

Undesirable effects such as colic, or even toxic symptoms, may be mitigated or avoided by the simultaneous injection of morphine (*see* "Morphine and Atropine").

H.T. 137. **Benzamine (Eucaine) Hydrochloride, 1/4 grain.**

Benzamine (eucaine) is a local anæsthetic; its action is not quite so prompt as that of cocaine but is more enduring and less likely to produce toxic effects. It is specially useful for operations on dogs, for which purpose 4 of the ¼-grain tablets may be dissolved in from 15 to 25 minims of sterile water according to the degree of anæsthesia desired. By the addition of 1 drop of 1 : 1000 solution of Adrenalin Chloride to the above-mentioned quantity the analgesic effect of the drug is intensified and hæmorrhage is lessened.

H.T. 46. **Caffeine, 1/2 grain.**

Caffeine is a diuretic and cardiac stimulant. It is of value in **canine dropsy,** also to aid the absorption of pleuritic effusion. It is used to support the heart in **acute asthenic diseases,** such as **distemper;** also as an antidote to opium or morphine. A small quantity of sodium saliclyate is included in this tablet to facilitate solution of the caffeine. Dose for a dog, ½ to 3 grains.

List Number.

H.T. 5. ● **Cocaine Hydrochloride, 1/4 grain.**

H.T. 47. ● **Cocaine Hydrochloride, 1/2 grain.**

V.H.T. 504. ● **Cocaine Hydrochloride, 1 grain.**

V.H.T. 530. ● **Cocaine Hydrochloride, 2 grains.**

Convenient for making solutions of any desired strength. A 1-grain tablet dissolved in 109 minims of distilled water provides a 1% solution; in 54 minims, 2%; in 36 minims, 3%; in 26 minims, 4%; in 21 minims, 5%; and in 10 minims, 10%. For local anæsthesia during operations, 5, 10 or 20 minims of a 1% solution may safely be used on puppies, and 60 to 120 minims for terriers; for large dogs as much as 200 minims may be used, or for very large dogs, such as mastiffs, even 300 minims. Solutions should be made freshly as required for use (*Veterinary Record*, August 5, 1916). The combination with Adrenalin as Codrenine (*see page* 125) is often to be preferred, as it produces ischæmia as wel as analgesia. In cases of sunstroke and heat apoplexy in horses inject subcutaneously 4 grains Cocaine Hydrochloride and ½ grain Strychnine Sulphate. If this is promptly administered further treatment is usually unnecessary.

V.H.T. 549. ● **Cocaine with Adrenalin.**

See notes on page 125.

H.T. 143. ● **Diamorphine Hydrochloride, 1/12 grain.**

H.T. 197. ● **Diamorphine Hydrochloride, 1/4 grain.**

A sedative of greater efficiency than either morphine or codeine, to the latter of which it is also superior as an analgesic though inferior to the former in this respect. Dose for horses and cattle, ½ to 1 grain; dogs, $\frac{1}{24}$ to $\frac{1}{6}$ grain.

V.H.T. 508. **Digitalin, Amorphous, 1/8 grain.**

V.H.T. 509. **Digitalin, Amorphous, 1/4 grain.**

A cardiac tonic and diuretic, indicated in **mitral insufficiency, palpitation** and **dropsical conditions.** Dose for cattle, ¼ to ¾ grain; for horses, ⅛ to ½ grain; for dogs, $\frac{1}{60}$ to $\frac{1}{30}$ grain.

H.T. 166. **Digitalin and Strychnine.**

Digitalin	$\frac{1}{100}$ grain
Strychnine Nitrate	$\frac{1}{60}$ grain

This combination provides a powerful cardiac stimulant for use in cases of **collapse.** Dose for dogs, ½ to 1 tablet.

Eserine, see **Physostigmine.**

Eucaine, see **Benzamine.**

Heroin, see **Diamorphine.**

Hyoscine, see **Scopolamine.**

H.T. 51. **Hyoscyamine (alkaloid), 1/100 grain.**

V.H.T. 510. **Hyoscyamine (alkaloid), 1/8 grain.**

Anodyne, antispasmodic and deliriant narcotic. Chiefly employed to relieve pain and allay nervous or muscular excitement. Dose for horses, ⅛ to ½ grain; dogs, $\frac{1}{100}$ to $\frac{1}{50}$ grain.

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List Number.

H.T. 14.● **Morphine Sulphate, 1/8 grain.**

H.T. 13.● **Morphine Sulphate, 1/4 grain.**

H.T. 26.● **Morphine Sulphate, 1/2 grain.**

V.H.T. 511.● **Morphine Sulphate, 1 grain.**

V.H.T. 512.● **Morphine Sulphate, 2 grains.**

Sedative, antispasmodic, narcotic. Employed in various painful conditions, *e.g.*, **enteritis, peritonitis,** etc., also in **acute laryngitis,** and to lessen labour pains in cases of difficult parturition. Given to horses prior to shoeing in order to obviate restiveness. An injection of morphine to dogs about to be operated on under local anæsthesia is a valuable tranquillising measure; for this purpose ⅛ grain may be given to a puppy and up to 2 or even 3 grains to an adult mastiff. Stupor ensues in about half an hour and may last for twenty-four hours. On some dogs, however, and some horses, too, morphine acts as an excitant instead of narcotic. Morphine may also be administered intravenously in **colic.** Teppaz and Duférchon (*Rec. Méd. Vét.*, October 30, 1917) state that if pain is still present an hour after bleeding and administration of pilocarpine or physostigmine, they inject 0·25 gm. (4 grains) of Morphine Sulphate into the jugular. The effect is instantaneous. They have treated numerous cases and have never had a death or local complication.

Chanier (*ibid.*, December 30, 1917) corroborates the above, but thinks that the dose is insufficient. He has often given half a gramme or even one gramme (8–16 grains) of morphia.

H.T. 15.● **Morphine and Atropine, ℞ 'B.'**

Morphine Sulphate	⅛ grain
Atropine Sulphate	1/200 grain

Dose for dogs, 1 to 2 tablets.

V.H.T. 536.● **Morphine and Atropine, No. 2.**

Morphine Sulphate	1½ grains
Atropine Sulphate	¼ grain

The constipation and nausea which often follow the hypodermic injection of morphine are less likely to occur if atropine be added to each dose; this also enhances the sedative action. Dose for horses and cattle, 1 to 2 tablets.

H.T. 130.● **Morphine and Strychnine.**

Morphine Sulphate	¼ grain
Strychnine Sulphate	1/60 grain

An anodyne and stimulant combination useful before an anæsthetic, after abdominal operations, and in cases of heart failure. Dose for dogs, ½ to 1 tablet.

V.H.T. 553. **Nuclein, 1-1/2 grains.**

See notes on page 74.

V.H.T. 514. **Physostigmine Salicylate, 1/4 grain.**

V.H.T. 538. **Physostigmine Salicylate, 1/2 grain.**

V.H.T. 539. **Physostigmine Salicylate, 1 grain.**

Physostigmine (eserine) is a gastric, intestinal and hepatic stimulant. It increases peristalsis and is indicated in intestinal obstruction depending upon **impaction of the colon,** with a paralysed condition of the walls of that viscus, but is contra-indicated in obstructions due to inflammatory conditions and for animals suffering from "heaves." It is a speedy remedy for **thoracic choke, impaction of the colon, rumen or omasum** (*Veterinary Record*, September 4, 1909, page 160). The administration of 1 grain hypodermically morning and evening is stated to be effective in **œsopha-**

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geal impaction (*Veterinary Record*, September 17, 1921). It is stated that physostigmine does not cause peristalsis if a narcotic drug has previously been given, therefore in cases of impaction in which a colic drink containing a narcotic has already been administered, it is better to use arecoline (*see page* 93) with, perhaps, a small dose of strychnine. Dose for horses and cattle, 1 to 2 grains. As the salt is not very soluble, *warm* distilled water should be used. It is not used in canine practice. Its solution is employed as a myotic to relieve **inflammation of the conjunctiva and cornea,** and, alternated with atropine, to break down adhesions in **iritis.**

V.H.T. 541. **Physostigmine Compound.**

Physostigmine Salicylate	$\frac{1}{4}$ grain
Pilocarpine Hydrochloride	$\frac{1}{2}$ grain
Strychnine Sulphate	$\frac{1}{8}$ grain

Increases gastric and intestinal secretions, stimulates peristalsis, and possesses a tonic action. Indicated in **intestinal obstructions** (*see preceding note*). Dose for horses and cattle, 1 to 2 tablets.

V.H.T. 542. **Physostigmine and Pilocarpine.**

Physostigmine Salicylate	$\frac{1}{8}$ grain
Pilocarpine Hydrochloride	1 grain

The characteristic action of physostigmine upon the muscular coats of the stomach and intestine is greatly enhanced by the addition of pilocarpine. Dose for horses and cattle, 1 to 2 tablets.

V.H.T. 515. **Pilocarpine Hydrochloride, 1/2 grain.**

V.H.T. 547. **Pilocarpine Hydrochloride, 1-1/2 grains.**

A powerful expectorant and sialagogue, used in **dropsy;** believed to increase intestinal secretions. Dose for horses, 2 to 3 grains; dogs, $\frac{1}{20}$ to $\frac{1}{3}$ grain. Solutions of this drug produce a myotic effect, and have been used in **glaucoma,** detachment of the retina, etc. In the early stages of **pink-eye (influenza) or shivering fits** in horses, pilocarpine is most useful in producing a thorough sweat. Inject $1\frac{1}{2}$ grains subcutaneously, and keep the patient well rugged, renewing with dry rugs, and free from draughts till the effects of the drug have worn off. In most cases this treatment brings about exceptionally good results.

H.T. 139. **Quinine and Urea Hydrochloride, 2 grains.**

See note on page 127.

H.T. 11. **Scopolamine (Hyoscine) Hydrobromide, 1/100 grain.**

The term "hyoscine" was first applied to an alkaloid obtained from hyoscyamus, but this alkaloid has since been derived from other solanaceous plants. Scopola rhizome yields scopolamine similar to hyoscine in chemical constitution and in physiological action. The British Pharmacopœia employs hyoscine and scopolamine as synonyms.

Hyoscine (scopolamine) hydrobromide is a valuable hypnotic and sedative. Dupins says that scopolamine is a valuable auxiliary in chloroform anæsthesia and the combined scopolamine-chloroform method is superior to any other (*Archivia Veterinaria*).

Scopolamine may be administered intravenously or subcutaneously. The dose varies according to the weight and temperament of the animal; for the dog or horse $\frac{1}{600}$ to $\frac{1}{250}$ grain *for each pound* of body weight is suggested. Hypodermic tablets of scopolamine (hyoscine) hydrobromide in other doses are also supplied.

H.T. 182. ●**Scopolamine (Hyoscine) and Morphine.**

Scopolamine (Hyoscine) Hydrobromide ..	$\frac{1}{100}$ grain
Morphine Hydrobromide	$\frac{1}{4}$ grain

Scopolamine (hyoscine) hydrobromide is a powerful cerebral and spinal sedative, having but little effect on the heart, and morphine is a valuable

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auxiliary in all its uses. This combination is very effective as an anodyne in **colic**; it is also employed preparatory to general anæsthesia; it allows of less anæsthetic being used and ensures less pain after operation. For the latter purpose, dogs should have the solution of one tablet injected in three equal portions, respectively, 150, 90 and 30 minutes before operating. This procedure is also of great assistance in such operations as firing, castration, bone-setting, etc., and in the dressing of painful wounds.

H.T. 23. **Strychnine Sulphate, 1/100 grain.**

H.T. 22. **Strychnine Sulphate, 1/50 grain.**

V.H.T. 543. **Strychnine Sulphate, 1/4 grain.**

V.H.T. 518. **Strychnine Sulphate, 1/2 grain.**

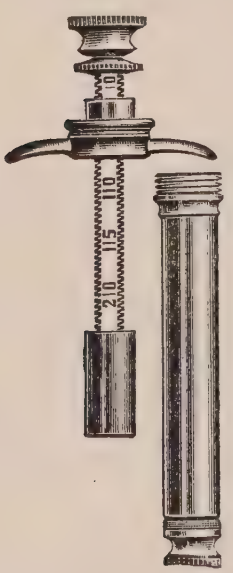
V.H.T. 519. **Strychnine Sulphate, 1 grain.**

Valuable in **general and local paralysis,** and as a general tonic. Dose for a dog, $\frac{1}{100}$ to $\frac{1}{60}$ grain; for horses and cattle, $\frac{1}{4}$ to 1 grain. A writer in the *Veterinary Record* (October 16, 1909, page 268) recommends as a humane, quick and easy method of destroying horses, dogs and cats, the injection of strychnine (10 grains for a horse, 2 grains for a dog or cat), either intravenously or between two ribs into the pleural cavity.

Trypan Blue, see page 87.

HYPODERMIC AND SERUM SYRINGES (P., D. & Co.).

The P., D. & Co. All-metal Hypodermic Syringe.—A very simple, reliable and durable instrument, easily and safely sterilisable, and readily adjustable. This syringe has no leather or rubber parts; the metal plunger is ground to fit the barrel. It is supplied in four sizes, capacity 20 minims, 80 minims, 10 c.c. and 20 c.c., respectively, with or without needles, also with or without a metal or leather-covered case for the pocket. Needles of various gauges are kept in stock. A nickel-plated pocket case containing a complete equipment of syringe, needles, hypodermic tablets, etc., is also supplied (*see page* 100).



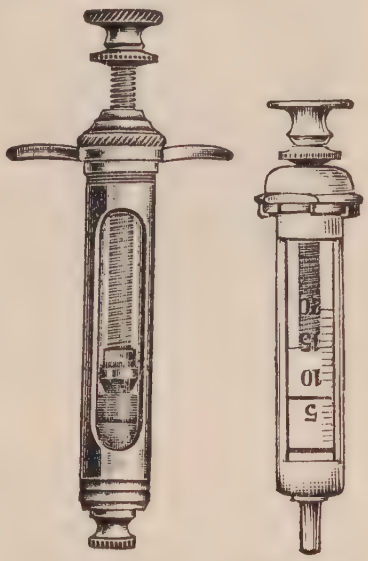
All-metal Hypodermic Syringe.

The 'Glasmet' Hypodermic or Serum Syringes.—These syringes consist of four primary parts. The barrel is of glass and is protected by a metal sheath. Both the barrel and piston rod are graduated, and the latter is furnished with a regulating screw. The metallic piston and needle-end plug are accurately ground to fit their individual barrel, and are not intended to be used with any other. Hence if any part of the syringe is broken or lost, *all parts* should

be returned to us, and we will forward a new syringe, making a charge only for that part which has been replaced.

These syringes may be sterilised by boiling in water, but it is *absolutely necessary* that the parts should be separated for the purpose, as otherwise the unequal degree of expansion of the metal and glass will fracture the latter. The syringe can be taken apart or re-fitted in a few seconds.

The 'Glasmet' Syringes are supplied in five sizes, capacity 1 c.c., 20 minims, 5 c.c., 10 c.c. and 20 c.c., respectively, with or without needles, also with or without nickel-plated cases which are adapted for use as sterilisers. Needles of various gauges are kept in stock.



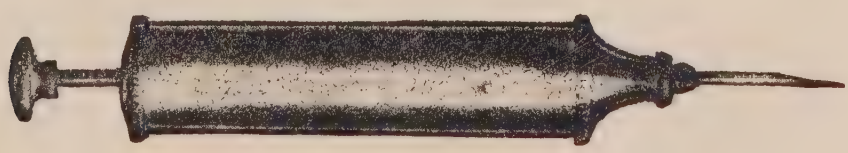
"Standard" Hypodermic Syringe. "Glasmet" Hypodermic Syringe.

The P., D. & Co. Standard Hypodermic Syringe.—This syringe is a thoroughly satisfactory instrument when only small quantities have to be injected. The barrel is of glass, capacity 20 minims, and is protected by a nickel-plated metallic shield provided with finger-grips. The graduated piston-rod can be regulated to control the amount of fluid to be injected. The leather plunger can be contracted or expanded as required.

The syringe is supplied with or without needles, also with or without a leather-covered case for the pocket. Needles of various gauges are kept in stock.

ANIMAL VACCINE INJECTOR.

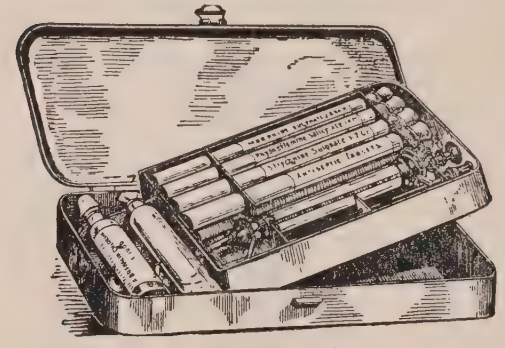
This is a strong, simple and durable instrument made of brass, nickel-plated, and fitted with a steel trocar needle, for introducing



beneath the skin vaccines in the form of pellets—for example, Anthraxoids or Blacklegoids.

POCKET HYPODERMIC CASE.

Veterinary Hypodermic Case, No. 13.—This case is made of nickel-plated metal, and measures 6 × 3¼ × ⅞ in. It is fitted with a metal hinged rack containing eight tubes of veterinary hypodermic tablets, and an 80-minim sterilisable 'All-metal' syringe with two needles. A small vial of Adrenalin Solution is also supplied, together with an empty stoppered vial for distilled water, etc.



VETERINARY HYPODERMIC CASE, No. 13.

STANDARDISED PRODUCTS.

The standardisation of preparations for therapeutic use is of great importance to the veterinary surgeon, no less than to the general medical practitioner, as the successful results obtained by any form of treatment depends, in a large measure, on the quality and accuracy of dosage of the preparations employed.

For more than fifty years Parke, Davis & Company have devoted their practically unlimited resources to perfecting methods for the standardisation of the products they manufacture. They were the first firm (by many years) to produce standardised drugs on a commercial and comprehensive scale, and this applies also to physiological standardisation in relation to preparations of Digitalis, Adrenalin, Ergot, Pituitrin, etc. Both in prescribing and dispensing the veterinary surgeon who specifies 'P., D. & Co.' secures all the advantages of standardised products with the inherent assurance of accuracy and dependability.

ANTISEPTICS, GERMICIDES AND PARASITICIDES, ANTI-INFLAMMATORY APPLICATIONS, VULNERARIES, ETC.

ADRENALIN OINTMENT (P., D. & Co.).

This preparation contains 1 part of Adrenalin Chloride incorporated in 1,000 parts of an ointment base. Supplied in convenient collapsible tubes.

Adrenalin Ointment, when applied to a mucous surface, secures a more prolonged constringent and ischæmic effect than can be obtained by the use of Adrenalin Chloride Solution. It is useful in **indolent inflammations, passive hæmorrhage, hæmorrhoids, chronic congestions of the nose or ear, inflammation of the urethra, vagina, etc.**

ADRENALIN AND CHLORETONE OINTMENT (P., D. & Co.).

This preparation contains 1 part of Adrenalin Chloride and 50 parts of Chloretone (*see page* 59) incorporated in 1,000 parts of an ointment base. Supplied in convenient collapsible tubes.

Adrenalin and Chloretone Ointment may be preferred in any of the conditions mentioned in the preceding section when they are accompanied by pain, for which cases the analgesic properties of Chloretone will co-operate beneficially with the constringent action of Adrenalin.

ANTISEPTIC TABLETS (P., D. & Co.).

Mercuric Chloride (Corrosive Sublimate)	**8¾ grains**
Sodium Chloride	**6¼ grains**

These tablets are very convenient for the preparation of antiseptic solutions of definite strength. They are artificially coloured as a precaution against misadventure. A solution of one tablet in twenty fluid ounces of water will contain 1 part of mercuric chloride in 1,000. This strength is suitable for the antiseptic treatment of **wounds,** also for application to the external genital organs of cattle in order to prevent **contagious abortion.** For the latter purpose it is customary in Australia to dissolve one tablet in three pints of water and syringe each in-calf cow or heifer with a pint of the solution once. (*Veterinary Record,* August 24, 1912, p. 111.)

Also see "Mercuric Iodide Compressed Tablets," page 112.

BLISTERING OINTMENT, VETERINARY (P., D. & Co.).

Powdered Cantharides	46 grains
Mercuric Iodide	24 grains
Oil of Turpentine	12 minims
Wool Fat and Petrolatum	a.a.q.s. ad 1 ounce

This preparation has the characteristic action of a powerful counter-irritant, the degree of irritation produced, and its duration, depending upon the mode of application. For example, one may obtain merely a rubefacient effect by gently rubbing the ointment over the parts; the application of a larger quantity of the ointment with more vigorous friction intensifies the reaction, so that a blistering effect is produced. A still more pronounced result is obtained by pyro-puncture, or firing with the actual cautery, before the application of the blistering ointment.

Veterinary Blistering Ointment (P., D. & Co.) is indicated for the treatment of **sprains, osteitis, periostitis, exostoses, spavins, splints, ringbones, sidebones,** etc. In conjunction with complete rest the application of this ointment will often bring about a cure in **synovitis** and **strains of tendons or ligaments.** It is sometimes beneficial in hastening the formation of **abscesses,** or aiding their resolution after indurations, when applied round these lesions. When used subsequently to the actual cautery, this ointment will cause swelling and close the opening in the abdominal parietes of small **umbilical hernias** of foals or calves; it is also valuable for closing and sealing **punctured wounds** in the joints and synovial cavities.

BOROSEPTIC OINTMENT (P., D. & Co.).

An antiseptic and mildly astringent dressing consisting of boric acid, zinc oxide and eucalyptol with a soothing and emollient base. It is supplied in collapsible tubes, also in tins containing 1, 5 or 10 pounds.

Boroseptic Ointment provides a valuable protective and healing application for **wounds,** also for **eczema, erythema, mange,** and other **skin eruptions.** In cases of **inflamed mucous membrane, blistered or abraded surfaces, sores, etc.,** this ointment induces an active reparative process, aids absorption of exudation or induration, and relieves pain.

CAMPHALUM (P., D. & Co.).

A powder dressing containing camphor, dried alum, boric acid and carbolic acid (4%). Supplied in tins with sprinkler tops.

Camphalum is an antiseptic, astringent and desiccant dusting powder for the treatment of **cuts, broken knees, wounds, etc.** It inhibits the growth of suppuration-producing bacteria, excludes further infection, and promotes granulation. It is also an excellent deodorant.

It promptly heals **saddle galls** and **collar chafes**, if applied in the initial stage before the subcutaneous fibrous tissue is involved; it subdues inflammation and prevents the formation of an abscess or callosity.

'CAPSOLIN' (P., D. & Co.).

This preparation contains oleoresin of capsicum, camphor, oil of turpentine, oil of cajaput and oil of croton in a bland base of ointment-like consistence. It is supplied in convenient collapsible tubes, also in tins containing 1, 5 or 10 pounds.

'Capsolin' is a **counter-irritant** which is extremely convenient as well as effective for the relief of all forms of deep-seated and local inflammation and congestion. Any degree of counter-irritation may be obtained, according to the quantity applied, the duration of the application, the amount of friction employed, and the character of the protective dressing. Ordinarily, a small quantity should be expelled from the collapsible tube on to the part affected, and rubbed into the skin till all is absorbed. In this way the advantages of an embrocation are secured without vesication, functional activity is at once stimulated and resolution promoted. If **vesication** is desired, it may be produced by vigorously rubbing in a liberal quantity of 'Capsolin' for ten minutes, and applying a covering of oiled silk.

'Capsolin' is a good external application in cases of respiratory diseases such as **influenza, strangles, pneumonia, pleurisy, peritonitis,** also in **muscular rheumatism** and **inflamed joints.**

CHLORETONE INHALANT (P., D. & Co.).

Chloretone ..	1 gramme	Menthol ..	2·5 grammes
Camphor ..	2·5 grammes	Oil of Cinnamon U.S.P. ..	0·25 gramme
Liquid Petrolatum ..	.. 93·75 grammes		

This antiseptic, local anæsthetic and emollient combination is designed for application in a finely divided spray to the nasal or pharyngeal mucosa by means of the 'Glaseptic.' Nebuliser in **irritable conditions, catarrhal and bronchial congestions, etc.** It is useful as a nasal spray or as a local application in the discharge of **distemper,** and has been reported to give very beneficial results in **roup** of fowls or pigeons.

A piece of lint saturated with Chloretone Inhalant is an excellent dressing for a **burn or abraded surface.**

A veterinary surgeon informs us that he finds Chloretone Inhalant very useful as an **antiseptic lubricant** for hypodermic syringes and needles.

Two American veterinary surgeons have informed us that they find Chloretone Inhalant applied by means of a 'Glaseptic' nebuliser

excellent for keeping the nostrils of racehorses open and for preventing infection or catarrhal conditions of the nasal mucous membrane.

CHLORETONE COMPOUND OINTMENT (P., D. & Co.).

Chloretone	.. 12½ grains	Hamamelin	.. 6¾ grains
Calomel ..	.. 12½ grains	Lanolin Ointment	
Hydrastine	.. 1 grain	Base ..	.. 1 ounce

This soothing, astringent and antiseptic ointment is of service in various cutaneous affections (**eczema, mange, etc.**), in irritable and inflammatory conditions of the rectum (**hæmorrhoids, pruritus, etc.**), as a dressing for indolent **ulcers, abscesses, etc.**, and for the udder in **garget**. It is supplied in collapsible tubes with elongated nozzles, which are convenient for rectal medication, also in tins containing 8 ounces.

DIBROMIN (P., D. & Co.).

Dibromin (d-brom-malonyl-ureide) is a synthetic compound produced by the action of bromine on barbituric acid, and has the formula $C_4Br_2N_2H_2O_3$. It is a white or cream-coloured crystalline substance, free from odour except for a slight suggestion of bromine. It is stable in the dry state ; thus it produces solutions of known bromine content and of assured germicidal activity. It is supplied in capsules containing 6 grains (in bottles of 10 or 50 capsules).

Dibromin combines the effectiveness of the best of the bacteria-destroying agents with exceptional freedom from the disadvantages that attach to most of them. It is so feebly toxic that it is incapable of harmful effect when used in the proper manner and aqueous solutions of Dibromin do not coagulate tissue albumins or blood serum. Dibromin is an effective deodorant and therefore useful in malignant and gangrenous processes. It is generally employed in dilute aqueous solution, though it has also been used as a dusting powder for ulcers.

Dibromin is soluble in water to the extent of between 3 and 4 per cent., and in glycerin up to 8 per cent.; it is freely soluble in alcohol but insoluble in oils. In order to facilitate the extemporaneous preparation of solutions, Dibromin is supplied in capsules containing six grains (0·388 gm.). The contents of one capsule dissolved in 7 pints (3·97 litres) of water produces a 1 : 10,000 solution (approx.); other strengths may be prepared by using proportional amounts of water.

The germicidal activity of Dibromin is due to bromine which is liberated when solutions are brought into contact with infected tissues, and which exerts a destructive oxidising effect on micro-organisms.

Laboratory tests which have been carried out with various pathogenic micro-organisms to demonstrate the germicidal value of Dibromin

have given the following phenol coefficients (Hygienic Laboratory method): for the typhoid bacillus, 105; streptococcus hæmolyticus, 213; bacillus pyocyaneus, 111; staphylococcus aureus, 100.

Solutions should be freshly prepared; they may be applied either cold or warm. They are incompatible with alkalies and reducing agents, and they attack slowly most metals and organic substances.

Solutions ranging in strength from 1 in 10,000 to 1 in 500 may be employed wherever an active germicide is required. The strength most suitable for a given case can best be determined by beginning with a dilute solution and increasing the concentration as the sensitiveness of the tissues permits.

Among the indications for the employment of Dibromin are **cellulitis, abrasions, abscesses, boils, cuts, ulcers, otitis, cystitis, vaginitis, infected sinuses, fistulæ,** etc. A 1 in 10,000 solution is likely to be of service for irrigation of the genital organs in combating **contagious abortion** of cattle. Spraying the mouth and nostrils with a 1 in 2,500 solution is suggested as a precaution against the spread of **influenza, foot and mouth disease,** and other infections.

EMOLLIENTINE (P., D. & Co.).

An antiseptic, astringent, soothing and restorative ointment containing aluminium hydrate, carbolic acid, ammonium ichthosulphonate, lead oxide, mercuric chloride and zinc sulphocarbolate. It is supplied in convenient collapsible tubes, also in tins containing 1, 5 or 10 pounds.

Emollientine speedily brings about the resolution of inflammation, the healing of sores, the maturation of suppurative processes, and the dispersion of skin affections analogous to intertrigo, etc. It is efficacious in the treatment of **eczema, psoriasis, erysipelas, favus** and other parasitic diseases, and is a useful application in **cracked heels, grease, mud fever, sore shoulders, saddle galls, overreach, broken knees,** and various minor lesions of the integument. It may be smeared beneath the eyes and nose **in distemper** to prevent "scalding," over udders to prevent or cure **garget**, and over teats in **cow pox**. It forms a valuable dressing for **ulcers** and incised **abscesses**, also for **canker** in the ear of the dog.

Emollientine reduces heat, stimulates cell action, mitigates pain, and prevents bacterial infection. Where practicable it should be spread on a piece of lint and applied to the part affected, being held in position by a bandage or by strapping, and renewed from time to time according to the conditions. In positions which cannot be dressed in this way, a fairly thick layer of Emollientine should be spread directly over the part.

ETHEREAL ANTISEPTIC SOAP, LIQUID (P., D. & Co.).

An etherealised hydro-alcoholic solution of Castile soap. Contains 20% of ether and 5% of alcohol.

The combined solvent, detergent and germicidal action of Ethereal Antiseptic Soap (P., D. & Co.) renders it possible to secure thorough cleanliness of the area of operation and of the surgeon's hands, finger-nails, instruments, etc., with comparatively little trouble or expenditure of time. The ether frees the cuticle from fatty material, thus depriving the germs of their means of protection, and exposing them to the bactericidal effect of the ether vapour. The diffusive power of the Ethereal Soap is remarkable. It permeates all folds and crevices of the cuticle, and irrigates the mouths of hair follicles and sebaceous ducts.

If for any reason it should be desired to enhance the germicidal activity of the Ethereal Soap, by powdering one 8¾-grain tablet of Mercuric Iodide, Soluble (P., D. & Co., No. 281), and adding to 20 ounces of the Liquid Soap, a 1 : 1000 solution of potassio-mercuric iodide will be obtained; or by powdering one Antiseptic Tablet (P., D. & Co., No. 113) and adding to 20 ounces of the Liquid Soap, a 1 : 1000 solution of mercuric chloride (corrosive sublimate) will be obtained.

If a teaspoonful be poured on the moistened palms, then rubbed over the hands till every cavity is penetrated, on the addition of a little water a lather may be worked up, which, after the free use of the nail-brush, may be rinsed off with water, and the sterilising process is complete.

Used after **parturition cases,** the Ethereal Soap removes any disagreeable odour that may cling to the hands. It is valuable for **sterilising the skin** prior to a hypodermic injection.

The bacteria-destroying properties of Ethereal Soap commend it for use in the **cleansing of sponges, swabs and surgical instruments.** A veterinary surgeon informs us that whereas formerly he frequently experienced sloughing and delayed healing of incisions made in **castration, docking and other small operations,** he has been spared that annoyance since he adopted the plan of sterilising his hands and instruments with the 'P., D. & Co.' Ethereal Soap.

This fluid forms a valuable application in **parasitic affections**; it may be employed for **itch** in cattle and for **scab or ticks** in sheep. For **mange** in dogs it should be well rubbed into the skin, and afterwards washed off. For **prurigo** in horses, and **lice** in all animals, it should be applied freely, and may advantageously be followed by a good scrub with a mixture of 8 fluid ounces of 'P., D. & Co.' Fluid Extract of Stavesacre Seed with 1 gallon of water.

Prior to the application of any other parasiticide, it is well to scrub the area with Ethereal Antiseptic Soap; this cleanses the skin and,

by removing epidermis, exposes the burrows of acari in **mange or scab. Chafing of the skin** produced by harness should be treated by washing the part with Ethereal Antiseptic Soap and then applying Camphalum (*see page* 102) or talcum powder.

'ETHOL' (P., D. & Co.).

A non-caustic cleansing fluid which is a rapid solvent of fat.

By means of 'Ethol' the hands may be easily freed from all forms of greasy dirt without the use of alkali, pumice stone, or other agent prejudicial to the skin. 'Ethol' is of frequent value to veterinary surgeons, especially to those who have to do with machinery, automobiles, cycles, etc. The *Motor News* says:—"It is the most perfect cleanser and the most rapidly acting we have ever seen."

'Ethol' is an excellent **cleansing medium for dairy utensils,** for besides being a solvent of grease it possesses antiseptic properties without toxicity or causticity.

'Ethol' forms a capital **shampoo liquid for dogs,** and has also the advantage of being obnoxious to fleas. A little should be poured on to the slightly moistened coat, and after it has been thoroughly distributed, a little water should be added, a lather worked up, and finally rinsed off with plenty of water.

EUTHYMOL (P., D. & Co.).

An agreeable non-toxic and non-irritant antiseptic, containing in each fluid ounce:—

Oil of Eucalyptus ..	⅓ minim	Menthol	⅐ grain
Thymol	⅓ grain	Benzoic Acid ..	½ grain
Oil of Wintergreen, Synthetic ..	¼ minim	Boric Acid ..	11 grains

Euthymol is an efficient **deodorant.** It is useful as a wash to improve the appearance of the coat of horses, cattle, dogs, etc., prior to exhibition; at the same time it neutralises skin effluvia. It is a valuable **remedy for insect stings.** Being non-poisonous, it may be administered internally, and is beneficial in **gastro-intestinal fermentation,** the dose for horses and cattle being from 2 to 6 fl. drachms; dogs, 30 to 60 minims; cats, 10 to 20 minims. Euthymol is valuable as a **germicidal spray for the mouth and throat** in equine pneumonia. For this treatment the 'Glaseptic' Spray (*see page* 113) is most suitable.

FECTO.

Fecto (P., D. & Co.) is an aqueous solution of alkaline hypochlorites with a trace of free chlorine ; altogether it contains about 4 per cent. of available chlorine. It has no pronounced odour, and when suitably diluted is not irritating to exposed tissues. One ounce of Fecto diluted with a gallon of water may be used for irrigating or dressing wounds, sinuses, fistulæ and abscesses.

Fecto is an extremely active disinfectant ; tested by the Rideal-Walker method, **it is twelve times as powerful as pure carbolic acid,** and is free from the dangers of that agent. It is one of the best disinfectants and deodorants for stables, stalls, pens, kennels, poultry houses, railway vans and other means of transport, as well as for drains, refuse heaps, etc. Diluted Fecto (1 oz. to a gallon of water) should be used to cleanse dairy utensils. The liberal use of diluted Fecto will materially aid in the prevention or extermination of infection in epidemics of pink-eye, foot and mouth disease, swine fever, canine distemper, etc.

Diphtheritic roup in poultry may be treated by adding Fecto to the drinking water ; the mouth and throat may also be washed out with the standard dilution of Fecto, using a glass syringe for the purpose.

For the treatment of **bacillary white diarrhœa in young chicks** the addition of a tablespoonful of Fecto to a gallon of the drinking water is recommended. It is readily taken by the birds in this strength, and is said to be quite harmless. Affected chicks should be given an injection of two teaspoonfuls of this solution up the vent by means of a glass syringe, and the same quantity should be given by the mouth at the same time as the injection. For larger birds the amount of solution may be increased up to two tablespoonfuls.

A dilution of one drachm of Fecto in one pint of water applied daily by means of a syringe has been reported to hasten the removal of necrotic material and to promote healing in cases of **fistulous withers** and **poll-evil.**

Mr. Hancock reports that diluted Fecto has a remarkable effect on suppurating **canker of the ear** in dogs (*Veterinary Journal,* November, 1924). He adds half an ounce of Fecto to a pint of warm water in a douche-can raised several feet above the animal, allowing the liquid to flow through a flexible catheter into the ear, and afterwards drying out with boracic powder.

It should also be freely used for the maintenance of hygienic conditions wherever animals are housed, and as for this purpose only **1 ounce** needs to be added to 1 **gallon** of water, **it is very economical in use.**

FLAVOLIN (P., D. & Co.).

A stimulating embrocation containing camphor, ammonia, rectified turpentine, etc.

Flavolin provides a very effective means of counteracting inflammation or muscular pain. When well rubbed into the skin it is very beneficial in cases of **sprains, swollen or stiff joints, rheumatism, pleurisy, etc.**

In **bronchitis, sore throat or pneumonia,** the relief that is conferred by the brisk external application of Flavolin may be enhanced by subsequently covering the part with a sheet of wadding suitably secured in position.

In cases of **visceral inflammation** it is often beneficial to spread over the abdomen a piece of lint saturated with Flavolin, covering this with a piece of oiled silk and laying over all several thicknesses of flannel wrung out in boiling water.

Flavolin is very economical in use. A small quantity briskly rubbed into the part affected until all the fluid is absorbed produces a strongly rubefacient effect, overcomes capillary congestion, and induces a free circulation of healthy blood.

Flavolin should specially appeal to veterinary surgeons who have hitherto compounded their own embrocations. The time and trouble entailed in so doing may with advantage be saved by making use of Flavolin, which is always reliable in quality and excellent in its effects.

GERMICIDAL SOAP (P., D. & Co).

A combination of mercuric iodide and a special soap which facilitates the application of the germicide and enhances its efficiency. Phenol coefficient; 30. Supplied in tablets, also a soft variety (in collapsible tubes) containing 1% of the iodide. The soaps are coloured blue to indicate their special character.

Germicidal Soap (P., D. & Co.) is one of the best and readiest agents for **preparing the hands** prior to operations, and for **sterilising the part to be operated upon;** it should also be used to cleanse the **site for a hypodermic injection,** for lack of which precaution abscesses frequently occur. It will be found very useful in **parturition cases** and in removal of decomposing placenta as a preventive of septic poisoning. It is valuable for disinfecting the hands, etc., after attendance upon communicable diseases. A stiff lather formed with this soap is six times as potent as 5% carbolic acid solution.

Germicidal Soap should be used to disinfect the parts of both bull and cow where **contagious abortion** is met with, and it is of value in the treatment of **mange, ringworm, eczema, and other parasitic or infectious skin diseases.** It penetrates the hair follicles and destroys the bacteria harboured by them. Among its many other uses it gives protection against the dangers of field **castrations**; it enables the

surgeon to sterilise his knife and emasculator and then to render the scrotum aseptic after the operation.

This soap does not attack steel or nickel-plated instruments, and therefore it is particularly suitable for rendering them aseptic. It does not coagulate albumin, as bichloride of mercury does, therefore it ensures intimate contact of the germicide with infecting organisms. For sterilising purposes the soft variety can be smeared directly over the skin, and a lather afterwards worked up with water. It is excellent for shampooing hairy surfaces on horses or cows infested with lice, fleas and other low organisms. It may usefully be applied after the manner of an ointment to **diseased joints, capped hock, ulcerated heels, shoulders or withers,** also for **canker** of the ear, and, well rubbed into the skin, for **sheep scab, pig maggots,** and the **grubs of warbles or bots.** A stiff lather forms a very satisfactory lubricant for the hands and arms in parturition cases, etc.

A solution of Germicidal Soap is excellent for douching, as it tends to dissolve pus, blood and mucus, whereas most other germicides coagulate them, also for the irrigation of surface lesions attended with fœtid discharge, fistulous tracts, abscesses, cracked heels and wounds. Half an ounce of the soap dissolved in 25 ounces of water will give a 1 : 5000 solution of mercury biniodide.

An M.R.C.V.S. says an ordinary lather of Germicidal Soap will kill the mange parasite in about two seconds.

A weekly wash with Germicidal Soap will keep a dog free from fleas and also from mange or other contagious infections.

HYDROGEN PEROXIDE SOLUTION (P., D. & Co).

This solution contains 3% by weight of absolute hydrogen peroxide, corresponding to about 10 volumes of available oxygen, in accordance with B.P. requirements. It is superior to that which is usually met with in commerce, in that it is less acid and it retains its oxygen for a much longer period.

Hydrogen Peroxide Solution (P., D. & Co.) is a **non-toxic and non-irritant antiseptic** which is said to be equal in germicidal power to a 1 : 1000 solution of corrosive sublimate, and which does not combine with albumin. For best results as a disinfectant it should be used repeatedly and freely.

Diluted with three volumes of water, Hydrogen Peroxide Solution is specially valuable for **cleansing accidental wounds** and for irrigation of **suppurations, sinuses, fistulæ and abscesses** ; it softens and dislodges pus, destroys bacteria and the various pus-forming cocci, and is stated to be one of the most effective combatants of the tetanus bacillus. In the treatment of cavities, care must be taken to provide for the free escape of gas which is evolved when the solution comes into

contact with organic matter, and which, if confined, might force pus into healthy tissues. Mixed with five times its volume of water it has given good results in **conjunctivitis and ulcers of the cornea.**

Good results have been recorded from its use in the treatment of **wounds, fistulæ, otitis, eczema, stomatitis and ocular diseases.** In undermined lesions, dressing with Hydrogen Peroxide Solution will assist the **removal of mortified structures.** The removal of gauze packing from cavities after operations is effected with much less pain and risk of bleeding than otherwise is usual, if the gauze is saturated layer by layer with the solution. This procedure also facilitates the removal of adhesive plaster.

Injections of from 40 to 150 c.c. of Hydrogen Peroxide Solution into the jugular vein of the horse have been credited with good results in **equine pneumonia.**

Injections into the udder of Hydrogen Peroxide Solution, either full strength or diluted with 1 or 2 volumes of water, one ounce for each quarter, are employed in **parturient toxæmia** and **contagious mammitis.** (Finlay Dun.)

Hydrogen Peroxide Solution has proved useful as a **uterine douche** after abortion, and in other purulent conditions of the uterus in cows or mares.

Internally, Hydrogen Peroxide Solution in doses of from 1 to 2 fluid drachms is of value in **gastric fermentative indigestion** of dogs.

Hydrogen Peroxide Solution has been used with success in the treatment of **blackleg** in its early stages. Harvey (*Veterinary News*, July 17, 1920) gives a report on three cases which were cured by hypodermic injections of Hydrogen Peroxide. In one case two ounces of a solution containing equal parts of Hydrogen Peroxide (P., D. & Co.) and water were injected subcutaneously at five points around and below the affected joint and the parts gently massaged. A brisk laxative dose of sulphate and bicarbonate of soda was then given. On the following day the animal was better, the leg less painful and no increase of swelling. No further treatment was required. Harvey remarks that the number of cases is too few to warrant definite conclusions, but years might elapse before a single practitioner would collect sufficient evidence, and the matter is placed on record in order that veterinary surgeons generally may, if so disposed, test the treatment and give their results. He is satisfied in his own mind that in the course of a few hours the cellulitis would have reached the muscular planes and that the typical black-quarter tumour would have developed.

After the replacement of an everted uterus, and also after the mechanical removal of the placenta, the injection of three ounces of Hydrogen Peroxide Solution into the uterus by means of a long-nozzled syringe once or twice daily was recommended by Mr. Mellock in the *Veterinary Record*, May 26, 1917.

Mr. Burnett states in the *Veterinary Record* of February 19, 1921:

" I consider that nothing is so good as a solution of Hydrogen Peroxide for flushing sinuses."

In **canine typhus,** Mr. Bloye recommends that the mouth should be mopped out several times a day with diluted Peroxide of Hydrogen Solution. (*Veterinary Record,* March, 1924.)

Mr. Livesey (*ibid.*, December, 1924) advocates the use of Peroxide of Hydrogen to keep the mouth, teeth and gums scrupulously clean in **canine distemper ;** it should be used two or three times a day, or more often if the mouth is at all foul.

MERCURIC IODIDE TABLETS, SOLUBLE (P., D. & Co.).

Supplied in two strengths, respectively containing 1 grain and 8·75 grains of potassio-mercuric iodide [equal to about $\frac{7}{10}$ grain and 6½ grains of mercuric iodide (biniodide of mercury)].

Soluble iodide of mercury is a **germicide** of great power, twelve times as active, it is said, as mercuric chloride. A 1-grain tablet dissolved in 8 ounces of water makes a strong disinfectant solution (about 1 : 3000) **for the hands, sponges, etc.** For **intra-uterine injections** in septic metritis, etc., or as an antiseptic surgical dressing, dissolve 1 grain in 24 to 32 ounces of water. One tablet of 8·75 grains dissolved in 20 ounces of water forms a 1 : 1000 solution ; in two pints, a 1 : 2000 solution, and so on. **For disinfecting the skin** prior to operations, 8·75 grains may be dissolved in from 10 to 40 ounces of alcohol.

Some authorities recommend the internal use of the soluble iodide of mercury (potassio-mercuric iodide) in cases of **lymphangitis, arthritis, actinomycosis and chronic skin diseases.** One tablet of 8·75 grains, dissolved in a little water and sprinkled over the food, may be given three times daily.

Capt. Willett reports in the *Veterinary Record,* August 18, 1923, a severe case of **actinomycosis** in which the cow was given 12 grains of biniodide of mercury each morning and evening. By the third day she was able to eat, and by the eighth she was practically cured.

An ointment made by powdering one tablet of 8·75 grains and combining it with lard or paraffin ointment has proved very beneficial for **enlarged thyroid glands** of foals, also for **chronic abscesses, fistulous withers, and capped elbows,** the cavities being first freed from pus, etc.

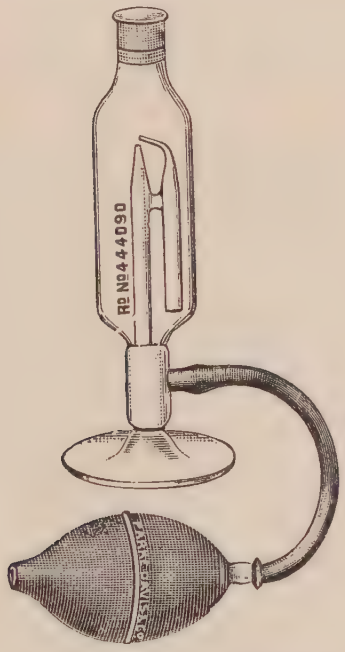
One tablet of 8·75 grains, dissolved in 1 fluid drachm of water, is useful for dressing the throat in **chronic coughs, in laryngitis, and in laryngismus stridulus.** Solutions of appropriate strengths have been found to give good results in **pruritus, ringworm, quittor, poll-evil, etc.,** and are also used to disinfect the parts of both cow and bull where **contagious abortion** is met with. In the last-named condition " repeated irrigation (with a suitable germicide) of the genital passages

lessens the danger of sepsis" (Wallis Hoare's *System of Veterinary Medicine*, vol. i., p. 338). "The genital mucosa of heifers and young cows is easily irritated, hence caution is necessary, so as to avoid the use of too strong injections." One tablet, 8·75 grains, in 5 pints of water, makes a 1 : 5000 solution, which may be freely used as a uterine douche on the pregnant cow, where infection is suspected or proved.

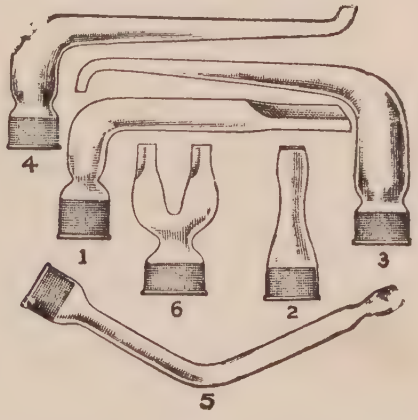
The 1 : 1000 aqueous solution is effective in **purulent ophthalmia.**

NEBULISERS AND SPRAYS.

'Glaseptic' Nebuliser (P., D. & Co.).—A particularly efficient apparatus, readily sterilised, which, though primarily intended for the atomisation of oily fluids, can also be used with ethereal, alcoholic, or



THE 'GLASEPTIC' NEBULISER.



NASAL, LARYNGEAL AND THROAT TUBES for attachment to the 'Glaseptic' Nebuliser.

1. Throat Tube. 4. Post-Nasal Tube.
2. Nasal Piece. 5. Long Nasal Tube.
3. Laryngeal Tube. 6. Double Nasal Piece.

aqueous solutions. It will produce an **extremely fine spray** with only a few drops of liquid. This mode of administration is greatly superior to the troublesome and uncertain method of steam inhalations.

The Nebuliser, **which can be** corked up to prevent evaporation or spilling of the fluid, is specially adapted for nasal or bronchial medication with Chloretone **Inhalant** or Adrenalin Inhalant.

When employing *oily* solutions, the subdivision of the nebula may be increased, and its localisation facilitated, if one of the nasal, laryngeal or throat tubes shown in the illustration be fitted on to the neck of the Nebuliser, according to the purpose in view. It is not desirable,

however, to employ any attachment (except, perhaps, No. 2) with aqueous or alcoholic solutions unless they contain at least 25% of glycerin.

A modified form of the ' Glaseptic ' Nebuliser, suitable for carrying in the pocket, is also supplied.

' Glaseptic ' Spray (P., D. & Co.).—This appliance is specially designed for the topical application of aqueous or alcoholic solutions, which it delivers in **good volume,** finely subdivided. For medication of the throat, cleansing of the nasal passages, spraying wounds with antiseptic solutions, and various other purposes, it is most effective.

NEO-PROTOSIL (P., D. & Co.).

A colloidal compound containing approximately 20% of silver iodide in association with a soluble protein base. Supplied in bottles of ½ and 1 ounce and also in capsules of 6 grains in bottles of 25 and 100.

Neo-Protosil exerts an antiseptic, astringent and sedative influence upon mucous surfaces. Its application is indicated for the treatment of all **inflammatory conditions of mucous membranes** of the eye, ear, nose, throat, bladder, uterus, etc.

Solutions of Neo-Protosil of from 10 to 20% are most commonly used, although Neo-Protosil is so free from irritating properties that a 40% solution may be used if necessary. A 10% solution may be applied to the nose and throat by means of a ' Glaseptic ' Nebuliser. One of the most useful fields of application of Neo-Protosil is in the treatment of inflammations of the genito-urinary tract, when solutions of from 5 to 40% in strength may be used according to the severity of the infection.

Neo-Protosil solutions are bland in all concentrations, and do not produce the dark stains characteristic of most silver preparations. They are truly colloidal in nature, and bacterial tests show that they are effective germicides. They are not precipitated by sodium chloride nor by urine of either acid or alkaline reaction.

Neo-Protosil occurs in the form of cream-coloured granules, which readily dissolve in water, but when making a solution the container should be briskly shaken to prevent the granules adhering together; for solutions above 20% in strength it is desirable to add the Neo-Protosil to warm water and to stir until solution is complete. Solutions that are more than one week old should not be used, as, on standing, the silver iodide is gradually deposited, with consequent loss of germicidal potency.

In the treatment of **roup** in poultry a solution of Neo-Protosil dropped into the eyes is said to be a useful measure in aiding recovery.

NEO-PROTOSIL OINTMENT.

Contains 5% of Neo-Protosil. Supplied in collapsible tubes with a special elongated nozzle.

Neo-Protosil Ointment is a convenient means of applying this medicament to the nasal mucous membrane or to the eye. It is particularly serviceable for the treatment of **persistent nasal discharge** and of the **conjunctivitis** which accompanies canine distemper. A small quantity of the ointment should be inserted into the nostrils and into each eye night and morning, or more frequently if necessary.

An M.R.C.V.S. reports that Neo-Protosil Ointment gives excellent results when employed in the treatment of **corneal ulcers** in the dog ; it has, he states a distinct effect in the **resolution of opacities.**

PROTOSIL (P., D. & Co.).

A proteid silver compound containing about 20% of silver. Supplied in coarse powder, also in capsules containing 6 grains (a convenient quantity for making solutions).

Protosil is particularly applicable in veterinary practice as an antiseptic and mild astringent in the treatment of **inflammatory conditions of the conjunctival membranes.** It does not cause the pain, swelling and lachrymation produced by silver nitrate ; nor does it lead to the formation of fibrinous coagula and the production of false membranes and opacities of the cornea, as silver nitrate may do. Moreover, as it is not precipitated by the salts of the tissues, and does not coagulate albumin as found in cellular protoplasm, its action is not interfered with by the tissue fluids as is that of nitrate of silver, so that it has a much greater penetrating effect. For inflammatory conditions of the eye and conjunctival infections with pneumococci and staphylococci, a 5 to 40% solution may be applied.

In the treatment of **acute inflammations of the mucous membrane,** Protosil may be applied in solution from 5 to 50% in strength. In **inflammatory infections of the ear, nose and throat** it may be used in 5 to 40% solution. In **canker of the ear** in dogs a 10% solution may be painted on with a camel-hair pencil, or sprayed into the ear.

For **irrigating sinuses,** a 2 to 5% solution may be employed. In **intestinal inflammatory infectious processes** irrigation with 1 in 1000 to 1 in 700 aqueous solution of Protosil is recommended.

Protosil is readily soluble in water : in this solution the silver is presented in the colloidal state ; it will pass through a paper filter, but not through the pores of an animal membrane.

PROTOSIL OINTMENT (P., D. & Co.).

Contains 5% of Protosil (*see preceding note*). Supplied in convenient collapsible tubes.

Protosil Ointment provides an excellent means of applying the remedy in positions where the application of a solution is not practicable or where a more persistent action is desired, *e.g.*, in **ophthalmia, sinusitis,** etc.

SCARLET RED OINTMENT (P., D. & Co.).

Contains 5% of Scarlet Red Sulphonate in a non-irritating emollient base. Supplied in collapsible tubes.

Scarlet Red Sulphonate exerts a remarkable stimulating influence upon granulating surfaces ; it causes healing, not by the formation of tissue, but by promoting the growth of normal skin, as can be demonstrated by section. The ointment is of special value as a healing application for **indolent ulcers, burns** and **slow healing wounds** of all kinds. If the exposed surface is extensive, the ointment should only be applied round the margin, and only allowed to remain for 24 to 48 hours, after which the part should be cleansed and a bland ointment applied for a similar period, and this alternation may be continued whilst necessary. If the area to be treated is only small, the ointment may be applied over the whole, either directly or on strips of cloth or soft linen (with intervals or perforations to allow secretions to escape), alternating with applications of a simple ointment.

STORAXOL (P., D. & Co.).

A combination of storax, resorcin, menthol, camphor, carbolic acid (5%) and precipitated sulphur in an emollient base. Supplied in convenient collapsible tubes, also in tins of 1, 5 and 10 pounds.

Storaxol is an effective and prompt remedy in all forms of inflammation, eruption and irritation of the skin, *e.g.*, **scabies, eczema, psoriasis, ringworm,** and other **parasitic skin diseases, pruritus ani, insect bites, etc.** It is an excellent remedy for all **external congestions and inflammations** ; applied to ulcerated surfaces, it speedily promotes healthy granulations.

One veterinary surgeon reports that Storaxol never fails to cure **eczema** in the head and ears of fox terriers ; another states that three applications of Storaxol will relieve any case of **papular mange** in dogs. In the treatment of follicular mange, sarcoptic mange, furunculosis, canker of the ear, etc., the application of Storaxol concurrently with injections of Staphylococcus-Streptococcus Bacterin, Canine (*see page* 20) gives excellent results.

Storaxol destroys the acari which cause **mange** or **scab**; in these cases the hair or wool must be shaved, or at least *closely* clipped, and the parts first freely rubbed with Ethereal Antiseptic Soap (*see page* 106), then coated with Storaxol. Next day the scabs should be well dried and again coated with Storaxol. In chronic cases, this procedure should be repeated once a week, whilst necessary.

THERMOFUGE, VETERINARY (P., D. & Co.).

A combination of ammonium iodide, thymol, menthol, eucalyptus oil, boric acid, aluminium silicate and glycerin, which forms a convenient and effective substitute for poultices, compresses or fomentations, and obviates the continuous attention which such applications entail for renewal, etc. Thermofuge is supplied in lever-lid tins.

Thermofuge is a valuable and effective antiphlogistic, emollient and derivative for external use in the treatment of **bronchitis, pneumonia, pleurisy, cough, sore throat, strangles, enteritis, nephritis, joint-evil, and other inflammatory affections.** It is also useful as an application for **harness galls, broken knees, capped hock, cracked heels, bruises, sprains, etc.** In cattle ailments, it may be applied over the loins in **inflammation of the kidneys and in parturient fever,** also to the udders for prevention or cure of **garget.**

In the *Veterinary Record* of February 7, 1914, Mr. R. P. Jones, Govt. Vet. Surgeon, East London, S. Africa, states that in cases of **acute parenchymatous mammitis** in cattle he obtains the best results by the application of warm Thermofuge to the affected quarter or quarters, laying over it one or two thicknesses of cotton wool with holes cut to allow the teats to hang through, and supporting the udder in a sling. In some instances he has also employed Bier's hyperæmic treatment. In his experience, cures have thus been effected more rapidly than by any other means; in from three to five days the animals have given normal quantity, and quality, of milk.

Thermofuge is reported to afford a reliable cure for **foot-rot** in sheep and **thrush** in horses. Applied to **quittors,** it reduces the pain, also assists maturation of the abscess and the detachment of necrotic tissue. It checks the inflammatory process of **dermatitis, erythema, grease and mud fever,** preventing gangrene or sloughing, and inducing speedy recovery. It is invaluable as a dressing in **punctured wounds of the feet** and in any case in which **suppuration** is present. A Thermofuge jacket applied in the initial stage of **pulmonary congestion, pleurisy,** etc., generally aborts the disease and prevents complications.

Thermofuge softens indurated tissue and reduces tense tumefactions; for this reason it forms an excellent dressing for **abscesses, curbs, sitfasts, etc.** It reduces swelling and capillary congestions; allays pain, soreness and throbbing; exerts a prolonged calefacient

action; stimulates absorption; and has an alterative effect upon swollen and inflamed glands. Applied immediately **after an operation,** Thermofuge brings about resolution in half the time that otherwise is usual.

Thermofuge is a thick paste; it is spread over the affected area in a smooth layer about a quarter of an inch in thickness, covered with oiled silk (or cotton wool) retained in position by a bandage, and allowed to remain for twenty-four hours. It avoids the necessity of applying a painfully hot mass to the skin, and it maintains its calefacient effect much longer than the hottest poultice, hence it does away with the necessity of frequent renewal.

In cases of **mallenders** it is found very effective to apply Thermofuge to the part overnight, and on the next morning to remove scales, etc., with hot water and soap, dry the part and apply a good dressing of Storaxol (*see page* 116).

THIODINE (P., D. & Co.).

Ammonium Sulphichthyolate	6 parts
Tincture of Iodine, U.S.P.	2 parts
Glycerite of Hydrastine	10 parts
Carbolic Acid	3 parts
Glycerin	59 parts
Boroglyceride Solution	20 parts

Thiodine exerts an astringent, antiseptic, depletive and counter-irritant influence. It is of particular service in the treatment of **inflammatory conditions of the uterus and adnexa.** It may be applied on a swab directly to the uterine cavity or a tampon of cotton may be saturated with the fluid, enclosed in a gelatin capsule (*see page* 55), and the whole introduced into the vagina, in the secretions of which the capsule will gradually dissolve and the medicament be set free to exert its antiphlogistic and derivative influence in the relief of engorged blood vessels, improving the local circulation and reducing inflammation.

For use in the case of small animals, the THIODINE VAGINAL SUPPOSITORIES, which contain 10% of the above-specified combination in a glycero-gelatin base, will be found convenient.

YELLOW OXIDE OF MERCURY OINTMENT (P., D. & Co.).

Supplied in two strengths, respectively containing 1% and 2% of yellow mercuric oxide in an impalpable condition.

Yellow mercuric oxide ointment has long been esteemed as a bactericidal and stimulating application in cases of **ophthalmia tarsi, corneal ulceration** and various forms of **conjunctival inflammation;** it is also beneficial in cases of eczema of the eyelids. For ocular appli-

cation, it is necessary to avoid the use of an ointment containing any irritating particles. The " P., D. & Co." Ointment is specially prepared for ophthalmic use by a process which secures freedom from grittiness ; it is supplied in convenient collapsible tubes with elongated nozzles that facilitate the application of the ointment to the inner surface of an everted eyelid.

ASSAYING ADRENALIN BIOLOGICALLY IN THE PARKE, DAVIS RESEARCH LABORATORY.

PREPARATIONS FOR SECURING LOCAL ANÆSTHESIA IN VETERINARY OPERATIONS.

In the performance of minor operations, the use of a local anæsthetic avoids the trouble and excitement incidental to securing or throwing an animal, and beside minimising the pain attending the actual surgical work it lessens the likelihood of a display of restiveness on the part of the animal; consequently it facilitates the work of the surgeon and favours a satisfactory result. Moreover, it avoids the dangers attendant upon the use of chloroform.

Mr. E. Wallis Hoare, writing in *Veterinary News* of February 28, 1914, remarks: "Local anæsthesia requires carefulness in the technique, and it has its limits in utility. In the case of major operations one cannot expect local anæsthesia to prove sufficient, but it should be employed in addition to the general anæsthetic in order to diminish the chance of surgical shock. One cannot expect deep-seated structures to be rendered anæsthetic by simply injecting the solution subcutaneously; deep injections should be made with a long needle, and plenty of solution should be employed. In many instances it is essential to inject the solution directly into the nerves supplying the part; thus, in the foot, the injection should be made into the plantar nerves at each side just above the fetlock. For firing, subcutaneous injections will suffice; the part should be massaged after the injection, so as to cause the solution to diffuse under a large area of the skin."

For purposes of subcutaneous infiltration, a needle about half an inch in length and of fine calibre, which will cause little pain on insertion, should be used. Some veterinary surgeons make the mistake of using too long and too stout a needle, which causes needless pain and which is more liable than a short one to break if the animal makes a sudden movement. In dealing with a nervous or vicious horse, Mr. Hoare recommends giving a hypodermic injection of morphine and hyoscyamine, or a rectal injection of chloral hydrate, half an hour before the operation.

Various agents are available for inducing local anæsthesia, and the different forms of the most approved of these are described on the following pages.

APOTHESINE.

A Synthetic Non-Toxic Local Anæsthetic.

DESCRIPTION.—Apothesine is the hydrochloride of gamma-diethyl-amino-propyl cinnamate. It occurs as small white crystals having a melting point of 137° C. It is readily soluble in alcohol, slightly soluble in acetone and ether, and very soluble in water. The solution in water is neutral to litmus. It is precipitated from solution by alkalies and by the ordinary alkaloidal reagents.

Apothesine has been tested experimentally on animals, and also clinically by actual use in thousands of minor and major surgical operations on human subjects, all demonstrating that it has a low relative toxicity and a remarkable freedom from irritating effect.

It is much less toxic than cocaine, and is not a derivative of cocaine.

While it has the same effect on the peripheral sensory nerves as cocaine, it is more slowly absorbed from mucous membrane and less freely diffusible in the subcutaneous tissues. Its anæsthetic effect is more lasting than that of cocaine.

It has no effect on the respiration or circulation when employed in normal doses.

It does not cause mydriasis or any disturbance of the accommodation, nor does it increase intra-ocular pressure.

Apothesine is not an escharotic or local poison, and its injection into the tissues in suitable concentration and quantity does not induce local inflammation or necrosis, and therefore does not interfere with primary wound healing.

It is remarkably stable, and the solutions can be sterilised by boiling in the usual way. A solution may be kept unchanged for several weeks, provided it is protected from bacterial growth by proper preservatives.

Our Veterinary Hypodermic Tablets of Apothesine contain Adrenlin, the powerful constringent effect of which controls operative and post-operative hæmorrhage. The dangerous toxic effects so frequently exhibited in animals when cocaine is injected, are notably absent in Apothesine anæsthesia.

Do not hurry. Like other synthetic anæsthetics, Apothesine diffuses through the tissues more slowly than cocaine. ALLOW A REASONABLE TIME (15 MINUTES) TO ELAPSE BEFORE BEGINNING TO OPERATE.

APPLICATION.

Apothesine is suitable in use for any surgical procedure in which a local anæsthetic is indicated, except perhaps for topical application to mucous membrane. The strength of the solution, in water or physiological salt solution, and the quantity to be injected, should be determined by circumstances and the nature of the case. The solutions

generally employed in veterinary practice range in strength from 1% to 3% for small animals and from 3% to 8% for large animals.

Clinical Tests.

Before Apothesine was offered to the veterinary profession it was subjected to a series of practical tests under field conditions for a period of eighteen months by a large number of veterinarians in various parts of the country. From the reports received and tabulated it was found that Apothesine had been used as the anæsthetic in a great variety of operations, and with perfectly satisfactory results. A partial list of operations includes the following:—

Abscesses.
Amputation of tail.
Amputation of toe.
Dentistry on dogs.
Diagnosing lameness.
Eye operations.
Firing spavins.
Firing chronic tendonitis.
Firing splints.
Neurectomies.
Quittors.
Removal of tumours from horses and dogs.
Roarers.
Thyroidectomy.
Trephining.

The following brief excerpts are taken from case reports sent in by veterinary surgeons:—

"I used Apothesine experimentally in amputating the tail of an adult mongrel dog. The tail at the site of incision was approximately one inch in diameter. I injected 1 drachm of a 4% solution in each side of the tail and allowed about 15 minutes for full anæsthetic effects, and then proceeded to operate by the "V" incision method. The dog did not flinch throughout the whole proceeding. Apparently skin anæsthesia was almost instantaneous, from the fact that when the first small needle was pushed through the skin the dog flinched and was inclined to protest, but an instant later the needle was injected on the opposite side in several places, and the skin was pricked with the point of a scalpel without the slightest protest from the dog. The tail healed rapidly in due season without the slightest trouble. In my opinion Apothesine proved far more effective in this case than cocaine has in similar operations in the past."

"We have used it as a local anæsthetic in 2% to 4% solution with Adrenalin on horses and dogs. In our opinion it is superior to cocaine; it does not excite the patient or cause irritation or sloughing, and its effects are more lasting than those of cocaine. We have used nothing else this summer on operations of the legs, especially quittors, and have discontinued the use of cocaine."

"Excision of a large granulous growth of coronary band, using a 3½% solution. A deep incision was made, but the horse did not flinch, and the wound healed with no sign of sloughing."

"Very satisfactory results. Most of the operations were amputa-

tions of the tail, or removal of tumours from dogs. If a small amount of fluid was required a 2% solution was used; if a larger amount of fluid, 1%."

"Used the solution on a lame horse for detecting lameness. After the injection the animal went sound. Also performed neurotomy on horse. Injected 10 c.c. of a 4% solution with complete anæsthesia. The horse did not flinch when the nerve was cut."

"I have used Apothesine in the following cases: Digital neurotomy, firing for spavin, and chronic tendonitis, removal of tumours, large and small, in dogs, horses, and in many minor operations. In canine cases 4% solution was used, and in horses 8%. So far I have had no toxic effects or excessive swelling, and am very much pleased with Apothesine, which is everything that could be desired as an anæsthetic."

"Amputated middle toe of cat. Used a 5% solution, injecting 3 c.c. into the foot, and waiting ten minutes. Anæsthesia was complete."

"I have used a 4% solution of Apothesine in six operations for roaring, a number of cases of neurotomy, and various other operations, including eye operations on dogs, with splendid results. I am highly pleased with Apothesine and shall continue to use it in my practice."

Veterinary Notes (Detroit, May, 1921) contained the following report relating to Apothesine:—"Prior to performing neurotomy in a case of laminitis I injected one drachm of 4% solution of cocaine in one leg, and in the other I injected 2½ grains of Apothesine dissolved in one drachm of water. The horse was standing, and behaved quietly during the operation. Two hours after the operation I found that the animal continually moved the leg into which cocaine was injected, showing severe pain. The whole of the horse's weight was on the leg in which the Apothesine had been injected, and he did not appear to move that leg at all, which goes to show that Apothesine is not only an ideal local anæsthetic, but also one that does not produce irritation or sloughing afterwards."

Apothesine, V.H.T., No. 557 (P., D. & Co.), are supplied in tubes of 10 tablets. Each tablet contains: Apothesine, 4½ grains; Adrenalin, $\frac{1}{500}$ grain.

Percentage Solution Table.

Dissolve one tablet in water or physiological salt solution to make

Quantity.	Apothesine.	Adrenalin.
1 fl. dr.	8%	1 : 30,000
2 fl. drs.	4%	1 : 60,000
4 fl. drs.	2%	1 : 120,000
1 fl. oz.	1%	1 : 240,000

The above percentage solution table will be found convenient for making up any strength of Apothesine solution desired. The tablets

should be dissolved in distilled water or physiological salt solution. A vehicle suitable for most surgical work is easily prepared by dissolving 4 grains of sodium chloride in 1 ounce of distilled water. One of our compressed tablets No. 365, Sodium Chloride, will make 4 ounces of physiological salt solution.

ADRENALIN AND BENZAMINE HYPODERMIC TABLETS
(No. 226. P., D. & Co.).

Each tablet contains $\frac{1}{2000}$ grain of Adrenalin and $\frac{1}{6}$ grain of benzamine (beta-eucaine) lactate.

One of these tablets dissolved in 9 minims of sterile distilled water forms a 2% solution of benzamine (beta-eucaine) lactate with 1 part of Adrenalin per 18,000 parts, suitable for producing analgesia and ischæmia prior to surgical operations.

● ADRENALIN AND COCAINE, ℞ "C," HYPODERMIC TABLETS
(No. 181. P., D. & Co.).

Each tablet contains $\frac{1}{1300}$ grain of Adrenalin and $\frac{3}{4}$ grain of cocaine hydrochloride.

One of these tablets dissolved in 40 minims of sterile normal saline solution (*see page* 86) will form a 2% solution of cocaine with 1 part of Adrenalin per 16,000 parts, suitable for producing analgesia and ischæmia (*see note on page* 125) prior to surgical operations. The solution may be injected hypodermically so as to infiltrate the entire field of operation, or in the case of a mucous surface it may be applied on a pledget of absorbent wool.

For operations in which there is a prospect of profuse bleeding it may be desirable to employ a larger proportion of Adrenalin in order to restrict hæmorrhage, and in such a case the Cocaine with Adrenalin Tablets (*see page* 125) may better meet the requirements.

The most suitable strength of cocaine solution to employ for local anæsthesia depends upon the nature and also upon the subject of the operation.* For terminal anæsthesia, a 2% solution is strong enough, and it should be introduced beneath the skin in small quantities placed closely together. If a nerve trunk is to be blocked, as in neurectomies, a stronger solution (say 5%, that is 5 of the No. 181 tablets dissolved in 80 minims of saline solution) is to be preferred, and should be deposited in the tissues as near to the nerve as possible.

● Subject to Dangerous Drugs Regulations.

* For a note on the maximum quantities of cocaine that may safely be used on animals, see page 126.

● COCAINE WITH ADRENALIN HYPODERMIC TABLETS (No. 549. P., D. & Co.).

Each tablet contains 2 grains of cocaine hydrochloride, ¼ grain of boric acid and $\frac{3}{100}$ grain of Adrenalin.

One of these tablets dissolved in 110 minims of sterile normal saline solution will form a 2% solution of cocaine with 1 part of Adrenalin in about 4,000 parts, suitable for producing analgesia and ischæmia by subcutaneous infiltration or by topical application to mucous membrane. Should any other strength of solution be desired, it may readily be obtained by adjusting the proportion of saline solution.

● "CODRENINE" (P., D. & Co.).

A solution for producing local anæsthesia and ischæmia preparatory to surgical operations. It contains 2% of cocaine (⅓ grain in 17 minims) associated with Adrenalin Chloride (1 grain in 15,000 minims) in physiological sodium chloride solution preserved with Chloretone.

The local anæsthesia produced by cocaine alone is but fleeting, owing to the rapid absorption of the drug, and the amount required for efficient anæsthesia is liable to produce toxic effects.* It has been found, however, that when adrenalin is used with the cocaine, weak solutions act as well as, or even better than, stronger solutions without the adrenalin, because the constringent properties of the latter prevent the too rapid absorption of the anæsthetic, and thereby its action is localised, intensified and prolonged.

It has been found that the addition of Chloretone to cocaine solutions is a perfect safeguard against deterioration, and solutions thus protected remain aseptic and active for an indefinite period. Moreover, it has been observed that when a cocaine solution containing Chloretone is injected, toxic effects are less likely to be caused.

For small operations (tumours, firing, neurectomy, etc.) or **dental extractions,** "Codrenine" may be used undiluted, but for producing analgesia over a large area one volume should be diluted with nine volumes of physiological sodium chloride solution [made by dissolving one Compressed Tablet Sodium Chloride (P., D. & Co., No. 365) in four ounces of distilled water and sterilising by boiling]. This strength injected into the structure of the skin, after Schleich's infiltration method, will enable minor operations to be carried out painlessly and with little if any bleeding. In using "Codrenine" for the **removal of tumours,** or the **opening of abscesses,** the solution is injected at several points in a circle about the base of the tumour or abscess, and not in the inflamed tissue of the latter. Injections subsequent to the

● Subject to Dangerous Drugs Regulations.

* For a note on the maximum quantities of cocaine that may safely be used on animals, see page 126.

first may be made painlessly by inserting the needle within the area rendered anæsthetic by the previous injection.

A veterinary surgeon informs us that by employing "Codrenine" when **docking horses,** no measures of restraint are necessary.

Another veterinary surgeon informs us that in **docking horses** he employs with the greatest satisfaction 40 minims of "Codrenine."

In cases of doubtful lameness in the horse, an injection of "Codrenine" into the plantar nerve trunk, on either side of the leg and a little above the point of selection for plantar neurectomy, will often completely abolish sensation in the foot. This fact may be determined by pricking the soft parts above the hoof. If there be complete anæsthesia of the foot, and the seat of lameness be situated therein, the horse will go sound while the anæsthesia lasts. This method may be taken advantage of in discovering localised lameness elsewhere. If "Codrenine" be injected over an area suspected to be the cause of lameness, and the animal goes sound while the "Codrenine" anæsthesia lasts, the site of lameness becomes certain. "Codrenine" is to be preferred to cocaine alone for making such a diagnosis because it localises the action of the anæsthetic.

In **eye work,** 5 to 10 drops of "Codrenine" are employed for various purposes, embracing examinations, removal of foreign bodies, operations, and the relief of suffering in acute inflammations resulting from natural causes or mechanical irritations. For enucleation, injection into the eyeball is preferable to instillation.

A veterinary surgeon reports the removal of a **hard mammary tumour** measuring 7 inches by 4 inches in a bitch after injecting 50 minims of "Codrenine." Complete anæsthesia was obtained in fifteen minutes, and the operation was completed without the slightest sign of pain. Several stitches were inserted, and the wound healed perfectly in a few days.

Mr. Widdens reports in the *Veterinary Record* of June 4, 1921, the "unexpected ease" with which he removed, under "Codrenine" anæsthesia, a **cyst** the size of a walnut from the head of a cat. The cat was not restrained in any way, and remained seated during the operation. There was no bleeding, and healing was uneventful.

The amount of cocaine that may be injected varies with the idiosyncrasy of the animal. In small dogs, says Professor Wooldridge, $\frac{1}{10}$ grain for each pound of body weight is usually safe. In larger dogs the same proportion may be employed, but not more than 2 grains in all (110 minims of "Codrenine") should be used. In cats also the same scale applies, but here the maximum quantity is $\frac{1}{4}$ grain (14 minims of "Codrenine"). In horses the maximum amount that can safely be used is 10 grains. Some horses are especially susceptible to cocaine and will exhibit toxic effects even from less than 10 grains of the drug.

QUININE AND UREA HYDROCHLORIDE.

The following preparations of the double salt of quinine and urea are available :
(1) Hypodermic Tablets (No. 139, P., D. & Co.), containing 2 grains in each, one of which dissolved in 220 minims of distilled water forms a 1% solution of the salt, in 110 minims a 2% solution, in 55 minims a 4% solution, and so on.
(2) Sterilised 1% solution in ampoules containing 5 c.c. (about 85 minims).

A solution of quinine and urea hydrochloride is employed to produce local anæsthesia prior to surgical operations, the area being infiltrated by repeated subcutaneous injections in precisely the same way as when using a cocaine solution.

The analgesia produced by an injection of quinine and urea is fully equal to that which can be obtained with cocaine, but it is much slower in attaining its maximum, hence 30 minutes should be allowed to elapse after the injection before an incision is made.

The persistence of the effect is remarkable, generally lasting for hours and in some instances for days, thereby obviating post-operative pain and lessening the risk of an animal interfering with the dressings. Quinine and urea is free from toxic properties, and it has (particularly in solutions of 2% and upwards) a decided hæmostatic effect which lessens the amount of bleeding in operations performed with its aid.

A sterile 1% solution is chiefly used, though when a speedy primary union is desired, and duration of analgesia beyond a few hours is of no advantage, some prefer to dilute that solution with from 1 to 3 volumes of sterile distilled water.

Stronger solutions have a greater hæmostatic effect than the 1% solution has, and for this reason they are sometimes preferred (up to 5%) in operations involving risk of much bleeding. Moreover, the local anæsthesia which such solutions produce is even more prolonged than that from the 1% solution, but there is a greater liability to cause induration of the tissues. The hæmostatic effect of the 1% solution may be increased by the addition of 3 minims of 1 in 1000 Adrenalin Chloride Solution to each c.c. of the former.

For topical application to mucous surfaces much stronger solutions (from 10% to 20%) are employed.

Some veterinary surgeons state that subcutaneous infiltration with quinine and urea does not anæsthetise the skin as perfectly as could be wished, and to avoid this it is suggested that the skin itself should first of all be infiltrated, using a fine needle and introducing it *between* the layers of skin until the bevelled portion of the needle is covered, then expelling a drop of the solution, subsequently pushing the needle a little further (but not beyond the edge of the wheal which results from the first drop) and expelling another drop, proceeding in this manner until the whole area of the proposed incision has been anæs-

thetised, after which the underlying tissues may be dealt with in the same way.

The amount of solution to be used varies with the strength of the solution and the extent of the area to be treated. If a 1% solution is used, from 15 to 25 c.c. will be ample for most operations ; a smaller quantity of a stronger solution gives more profound and more enduring anæsthesia.

As it has been shown that the hypodermic injection of any quinine solution temporarily lowers the vitality of the tissues of the part thereby lessening the power of antagonising an invading organism, strict asepsis before, during and after operations under quinine and urea anæsthesia is of special importance.

NORMAL TEMPERATURES OF ANIMALS.

In view of the importance, for the purposes of diagnosis, of accurate information as to the temperature of a patient, it is necessary that variations in temperature should be carefully recorded by means of the clinical thermometer. The temperature is registered by placing the thermometer in the rectum, and keeping it there from half a minute to three minutes. Care should be taken that the bulb of the thermometer comes into contact with the mucous membrane, otherwise the correct reading will not be taken. The following table gives the temperatures, pulse rate, and rate of respiration of various animals in health :—

Animal.	*Temperature.*	*Pulse.*	*Respiration.*
Horse . . .	100·2° F. ..	35–45 ..	8–12
Ox	102° F. ..	45–60 ..	12–16
Pig	102° F. ..	55–80 ..	20–30
Dog	101·5° F. ..	70–95 ..	15–25
Sheep . . .	103° F. ..	70–80 ..	20–30
Cat	— ..	110–130 ..	—
Camel . . .	98·6° F. ..	45–50 ..	5–7

The foal, calf and lamb invariably have a higher pulse rate than the adult animals. The temperature of the camel varies from 96° F. between 2 a.m. and 7 a.m. and 101° F. between 2 p.m. and 6 p.m., the variation being due to the difference in the atmospheric temperatures, and, in particular, to moist cold, to which the animals are particularly sensitive.

VETERINARY POSOLOGICAL TABLE.

The doses given below are for medium-size animals, as the dosage must vary according to age and breed. See Table (*page* 133) for regulating the doses for young animals, also note on Veterinary Posology (*page* 133); also under Fluid Extracts (*pages* 63–69).

1 fluid ounce = 28·5 c.c.
17 minims = 1 c.c.

Drug or Preparation.	Cattle.	Horses.	Sheep.	Pigs.	Dogs.	Cats.
Acetanilide	40–90 grs.	30–60 grs.	4–15 grs.	3–10 grs.	1–3 grs.	½–1 gr.
Acid Arseniosum	5–8 grs.	2–6 grs.	⅛–¼ gr.	⅛–¼ gr.	1/60–1/20 gr.	1/100–1/40 gr.
,, Boric	1½–4 drs.	1–3 drs.	10–30 grs.	7–20 grs.	3–10 grs.	2–5 grs.
,, Carbolic Liq.	30–80 min.	20–60 min.	5–15 min.	5–15 min.	1–3 min.	½–1 min.
,, Hydrocyanic, Diluted, B.P.	30–60 min.	20–60 min.	10–15 min.	4–12 min.	2–5 min.	1–3 min.
,, Salicylic	3–6 drs.	2–4 drs.	½–1 dr.	7–20 grs.	5–15 grs.	3–10 grs.
,, Tannic	40–120 grs.	30–90 grs.	5–20 grs.	4–15 grs.	2–5 grs.	1–3 grs.
Aconite Root, Fluid Extract	3–10 min.	2–5 min.	¼–1 min.	¼–1 min.	1/20–⅕ min.	1/40–1/20 min.
Aconite Root, Powd. Extract	2–5 grs.	2–5 grs.	¼–¾ gr.	¼–¾ gr.	1/20–⅕ gr.	1/40–1/10 gr.
Adrenalin Solution	1–2 drs.	30–60 min.	10–30 min.	5–20 min.	5–10 min.	1–2 min.
Æther (stimulant)	2–3 ozs.	1–2 ozs.	2–4 drs.	2–4 drs.	20–60 min.	10–30 min.
Aloes	1–2 ozs.	2–8 drs.	1–4 drs.	1–4 drs.	5–30 grs.	2–10 grs.
Aloes Compound, Liquid	4–16 ozs.	3–12 ozs.	3–6 ozs.	3–6 ozs.	½–3 ozs.	2–8 drs.
Aloin (P., D. & Co.)	1½–3 drs.	1½–2 drs.	20–60 grs.	20–60 grs.	2–10 grs.	1–4 grs.
Alum	3–5 drs.	2–4 drs.	½–2 drs.	½–2 drs.	5–20 grs.	2–10 grs.
Ammonium Carbonate	2–8 drs.	1–3 drs.	½–1 dr.	15–30 grs.	3–8 grs.	1–4 grs.
Antimony Tartrate	1–4 drs. (sedative &	1–3 drs. alterative)	6–12 grs. (emetic)	6–10 grs. (emetic)	1–4 grs. (emetic)	½–2 grs. (emetic)
Antipyrine	2–4 drs.	1–2 drs.	½–1 dr.	15–30 grs.	3–10 grs.	1–5 grs.
Anti-Influenza Serum (Equine)	— —	30 c.c. (foals 10–15 c.c.) repeated in 12 hrs.	— —	— —	— —	— —
Antistreptococcus Serum, Equine (prophylactic)	—	30 c.c.	—	—	—	—
(curative)	—	30 c.c. repeated	—	—	—	—
Antitetanus Serum, Veterinary (prophylactic)	—	500 units	—	—	—	—
(curative)	—	3,000 units	—	—	—	—
Anti-White-Scour Serum (prophylactic)	calves 10–20 c.c.	—	—	—	—	—
(curative)	10–30 c.c. repeated	—	—	—	—	—
*Apomorphine Hydrochloride (emetic)	—	—	—	1/10–¼ gr.	1/20–1/10 gr.	—
*Arecoline Hydrobromide	½–1 gr.	½–1 gr.	—	—	1/100 gr.	—
Arnica Flowers, Fluid Extract	1–2 drs.	50–100 min.	10–20 min.	5–15 min.	2–6 min.	½–2 min.
Asafœtida, Fluid	1–3 drs.	1–2 drs.	5–30 min.	5–20 min.	2–10 min.	1–5 min.
Aspidium, Oleoresin, see Male Fern Extract	—	—	—	—	—	—

* The doses stated for this drug are those suitable for hypodermic administration.

Veterinary Posological Table—*continued.*

Drug or Preparation.	Cattle.	Horses.	Sheep.	Pigs.	Dogs.	Cats.
*Atropine Sulphate	$\frac{1}{6}$–$\frac{1}{2}$ gr.	$\frac{1}{10}$–$\frac{1}{4}$ gr.	$\frac{1}{15}$–$\frac{1}{8}$ gr.	$\frac{1}{30}$–$\frac{1}{15}$ gr.	$\frac{1}{200}$–$\frac{1}{100}$ gr.	—
Belladonna Leaves, Fluid Extract	1–3 drs.	$\frac{1}{2}$–2 drs.	10–30 min.	2–10 min.	1–6 min.	$\frac{1}{4}$–1 min.
Belladonna Root, Liquid Extract	$\frac{1}{2}$-1$\frac{1}{2}$ drs.	15–60 min.	5–30 min.	2–8 min.	1–5 min.	$\frac{1}{4}$–1 min.
Belladonna, Powd. Extract	5–16 grs.	4–12 grs.	1–3 grs.	$\frac{1}{2}$–2 grs.	$\frac{1}{4}$–1 gr.	$\frac{1}{8}$–$\frac{1}{2}$ gr.
Benzoin Compound, Liquid	2–8 drs.	2-4 drs.	5–20 min.	5–15 min.	2–10 min.	$\frac{1}{4}$–1 min.
Bismuth Subnitrate	1–2 drs.	$\frac{1}{2}$–1 dr.	10–30 grs.	10–30 grs.	5–20 grs.	2–10 grs.
Bromide and Chloral Compound, Elixir	2–3 ozs.	1–2 ozs.	—	—	$\frac{1}{2}$–1 dr.	15–30 min.
Buchu, Liquid	—	$\frac{1}{2}$–1 oz.	—	—	50–100 min.	—
Calabar Bean, Fluid Extract	10–30 min.	10–20 min.	—	1–5 min.	$\frac{1}{2}$–2 min.	—
Calomel	1–2 drs.	1–2 drs.	$\frac{1}{4}$–1 dr.	$\frac{1}{4}$–1 dr.	2–5 grs.	1–3 grs.
Camphor	2–4 drs.	1–2 drs.	20–40 grs.	10–20 grs.	1–10 grs.	$\frac{1}{2}$–5 grs.
Cannabis Indica, Normal Liquid	2–4 drs.	1–3 drs.	5–10 min.	5–10 min.	2–5 min.	$\frac{1}{4}$–1 min.
Cantharides, Fluid	15–20 min.	10–15 min.	1–6 min.	1–6 min.	$\frac{1}{2}$–2 min.	$\frac{1}{4}$–1 min.
Capsicum, Fld. Ext.	20–60 min.	15–40 min.	5–10 min.	5–10 min.	1–3 min.	$\frac{1}{2}$–2 min.
Carbon Tetrachloride	—	—	1 c.c.	—	—	—
Cascara Evacuant	—	4–8 drs.	30–90 min.	15–60 min.	5–60 min.	2–10 min.
Cascara Sagrada, Fluid Extract	1–4 drs.	1–3 drs.	30–90 min.	15–60 min.	5–60 min.	2–10 min.
Cascara Sagrada, Powd. Extract	—	—	—	5–15 grs.	2–8 grs.	1–4 grs.
Cascarin Compound Condition Powder	1–3 ozs.	1–3 ozs.	$\frac{1}{4}$–$\frac{1}{2}$ oz.	1–3 drs.	—	—
Castor Oil	1–1$\frac{1}{2}$ pts.	$\frac{1}{2}$–1 pint	2–4 ozs.	2–4 ozs.	$\frac{1}{2}$–1 oz.	1–4 drs.
Catechu, Liquid	2–8 drs.	2–4 drs.	1–3 drs.	10–60 min.	5–20 min.	1–4 min.
Chenopodium, Oil of	—	$\frac{1}{2}$ oz.	—	—	5–20 min.	—
Chloral Hydrate	1–2 ozs.	$\frac{1}{4}$–1 oz.	$\frac{1}{4}$–2 drs.	15–60 grs.	5–20 grs.	2–10 grs.
Chlor-Anodyne, Veterinary	40–160 min.	40–160 min.	20–60 min.	10–40 min.	2–15 min.	$\frac{1}{2}$–4 min.
Chloretone	2–4 drs.	2–4 drs.	30–60 grs.	15–40 grs.	3–15 grs.	—
Cinchona, Liq. Ext.	2–6 drs.	1–4 drs.	—	10–60 min.	5–30 min.	1–4 min.
Cocillana Compound Syrup	—	—	—	—	$\frac{1}{2}$–2 fl. drs.	—
Cod Liver Oil Emulsion, 33%	—	—	—	$\frac{1}{4}$–1 oz.	1–4 drs.	$\frac{1}{2}$–2 drs.
*Colchicine	$\frac{1}{6}$–$\frac{1}{2}$ gr.	$\frac{1}{6}$–$\frac{1}{2}$ gr.	—	—	$\frac{1}{120}$–$\frac{1}{50}$ gr.	—
Colchicum Seed, Fluid Extract	30–90 min.	20–60 min.	—	5–10 min.	2–4 min.	$\frac{1}{6}$–1 min.
*Coniine Hydrobromide	$\frac{1}{2}$–1$\frac{1}{2}$ grs.	$\frac{1}{2}$–1$\frac{1}{2}$ grs.	$\frac{1}{5}$–$\frac{2}{5}$ gr.	$\frac{1}{5}$–$\frac{2}{5}$ gr.	$\frac{1}{60}$–$\frac{1}{30}$ gr.	—
Creosote	$\frac{1}{2}$–1 dr.	10–30 min.	5–12 min.	2–10 min.	1–3 min.	$\frac{1}{2}$–2 min.
Croton Oil	5–40 min.	5–20 min.	—	5–10 min.	$\frac{1}{4}$–1 min.	—
Damiana, Fld. Ext.	4–8 drs.	2–6 drs.	—	—	10–30 min.	—
Damiana, Nux Vomica, Iron and Phosphorus Elixir	2 fl. ozs.	2 fl. ozs.	—	—	$\frac{1}{2}$–1 fl. dr.	—
*Diamorphine (Heroin) Hydrochloride	$\frac{1}{2}$–1 gr.	$\frac{1}{2}$–1 gr.	—	—	$\frac{1}{24}$–$\frac{1}{6}$ gr.	—
Diamorphine and Terpin Hydrate Elixir	1–2 ozs.	—	—	—	$\frac{1}{2}$–2 drs.	—
*Digitalin (Amorphous)	$\frac{1}{4}$–$\frac{3}{4}$ gr.	$\frac{1}{3}$–$\frac{1}{2}$ gr.	$\frac{1}{30}$–$\frac{1}{5}$ gr.	$\frac{1}{30}$–$\frac{1}{10}$ gr.	$\frac{1}{60}$–$\frac{1}{30}$ gr.	—
Digitalis, Normal Liquid	10–30 min.	10–25 min.	2–8 min.	2–5 min.	$\frac{1}{2}$–2 min.	$\frac{1}{4}$–$\frac{1}{2}$ min.

* The doses stated for this drug are those suitable for hypodermic administration.

Veterinary Posological Table—*continued.*

Drug or Preparation.	Cattle.	Horses.	Sheep.	Pigs.	Dogs.	Cats.
Digitalis, Pwd. Ext.	3–10 grs.	3–8 grs.	1–3 grs.	1–2 grs.	¼–1 gr.	⅛–¼ gr.
Echinacea, Fld. Ext.	3–6 drs.	2–4 drs.	25–50 min.	15–30 min.	10–20 min.	—
Equine Cough Syrup	1–3 ozs.	1–3 ozs.	—	—	½–2 drs.	—
*Ergot Aseptic	2–8 drs.	1–3 drs.	15–30 min.	5–20 min.	15 min.	1–5 min.
Ergot, Normal Liquid	½–1 oz.	2–6 drs.	1–2 drs.	1–2 drs.	20–60 min.	2–10 min.
Eserine (*see* Physostigmine).						
Euphorbia Compound, Elixir	—	—	—	—	½–2 drs.	15–60 min.
Gelsemium, Fld. Ext.	1–3 drs.	1–2 drs.	10–30 min.	5–20 min.	1–3 min.	½ min.
Gentian, Fld. Ext.	1–2 ozs.	2–6 drs.	40–120 min.	10–60 min.	5–20 min.	2–10 min.
Ginger, Fld. Ext.	1–3 ozs.	1–2 ozs.	10–60 min.	5–30 min.	2–10 min.	½–2 min.
Hamamelis, Fld. Ext.	½–1 oz.	2–4 drs.	—	—	5–20 min.	—
Hydrastis, Fld. Ext.	2–8 drs.	1–4 drs.	10–40 min.	10–30 min.	5–20 min.	½–3 min.
Hydrastis, Powd. Extract	20–120 grs.	20–120 grs.	5–15 grs.	2–10 grs.	1–5 grs.	—
Hyoscyamus, Fluid Extract	2–8 drs.	1–4 drs.	10–30 min.	5–20 min.	2–10 min.	½–2 min.
Hyoscyamus, Powd. Extract	10–60 grs.	10–60 grs.	2–6 grs.	1–4 grs.	½–2 grs.	—
Ipecacuanha, Liquid Extract	1–2 drs.	1–2 drs.	30–60 min.	5–15 min.	1–5 min.	1–3 min.
Iron Sulphate	½–4 drs.	½–4 drs.	5–30 grs.	5–20 grs.	1–10 grs.	½–5 grs.
Jaborandi, Fluid Ext.	2–4 drs.	1½–3 drs.	10–30 min.	10–25 min.	5–15 min.	½–2 min.
Jalap, Fluid Ext.	¼–1 oz.	1–4 drs.	20–60 min.	20–120 min.	10–90 min.	5–20 min.
Jalap, Powd. Ext.	—	—	—	10–60 grs.	10–30 grs.	1–5 grs.
Juniper Berries, Fluid Extract	1–8 drs.	1–8 drs.	10–30 min.	10–20 min.	2–8 min.	1–3 min.
Krameria, Fld. Ext.	1–3 drs.	1–2 drs.	30–60 min.	10–30 min.	5–15 min.	2–5 min.
Linseed Oil	1–2 pts.	½–1 pt.	4–8 ozs.	2–6 ozs.	½–2 ozs.	—
Liquorice, Fld. Ext.	2–8 drs.	1–6 drs.	15–60 min.	10–40 min.	2–10 min.	1–5 min.
Lobelia, Fld. Ext.	1–8 drs.	½–4 drs.	—	5–20 min.	2–10 min.	—
Magnesium Sulphate	½–1½ lbs.	1–4 ozs.	1–4 ozs.	1–3 ozs.	2–4 drs.	1–2 drs.
Male Fern Extract (Oleoresin of Aspidium)	¼–1 oz.	2–6 drs.	1–3 drs.	1–3 drs.	15–60 min.	4–10 min.
Mercuric Iodide	2–6 grs.	2–4 grs.	½–2 grs.	¼–1 gr.	1/16–¼ gr.	—
Mixed Infection Phylacogen (hypodermically or intravenously)	15–20 c.c. repeated	10–15 c.c. repeated	1–3 c.c. repeated	1–2 c.c. repeated	½–1 c.c. repeated	¼–½ c.c. repeated
*Morphine Hydrochloride	3–6 grs.	2–4 grs.	½–1 gr.	1/10–½ gr.	1/20–¼ gr.	1/40–⅛ gr.
Mugwort, Fld. Ext.	2–8 drs.	2–6 drs.	1–3 drs.	30–60 min.	20–60 min.	5–20 min.
Myrrh. Fld. Ext.	—	10–30 min.	—	10–30 min.	5–15 min.	—
Nitroglycerin	¼–½ gr.	¼–½ gr.	—	1/100–1/50 gr.	1/100–1/50 gr.	—
Nuclein Solution, 5% (orally)	1–2 ozs.	1–2 ozs.	—	—	2 min. per lb. weight	—
,, (hypodermically)	85–350 min.	85–350 min.	—	—	1 min. per lb.	—
Nux Vomica, Liquid Extract, B.P.	30–60 min.	20–40 min.	5–20 min.	3–10 min.	½–1 min.	1/20–⅕ min.
Nux Vomica, Powd. Extract	5–15 grs.	5–15 grs.	1–5 grs.	1–3 grs.	⅛–¼ gr.	1/60–1/20 gr.
Opium	1–2 drs.	½–2 drs.	5–20 grs.	4–15 grs.	½–5 grs.	⅛–1 gr.
Opium, Concentrated Liquid	1–3 drs.	40–120 min.	5–30 min.	3–20 min.	1–4 min.	¼–1 min.
Opium, Powd. Ext.	10–60 grs.	10–60 grs.	5–15 grs.	3–10 grs.	¼–1 gr.	⅛–¼ gr.

* The doses stated for this drug are those suitable for hypodermic administration.

Veterinary Posological Table—*continued.*

Drug or Preparation.	Cattle.	Horses.	Sheep.	Pigs.	Dogs.	Cats.
Pepsin, Concentrated Glycerin of . .	—	—	—	—	20–40 min.	10–30 min
Petrolatum, Liquid (Liquid Paraffin) .	15–30 ozs.	8–16 ozs.	6–10 ozs.	6–10 ozs.	½–1 oz.	½–4 fl. drs
Petroleum Emulsion with Hypophosphites	—	—	—	—	1–4 drs.	½–2 drs.
Phenacetin . . .	2–4 drs.	2–4 drs.	½–1 dr.	15–30 grs.	2–10 grs.	—
*Physostigmine Salicylate	1–2 grs.	1–2 grs.	—	—	—	—
Phytolacca, Fluid Extract . . .	1–2 drs.	30–80 min.	8–15 min.	5–10 min.	2–5 min.	1–2 min.
*Pilocarpine Hydrochloride . . .	2–5 grs.	2–3 grs.	¼–1 gr.	¼–1 gr.	$\frac{1}{20}$–⅓ gr.	—
Pneumonia Phylacogen (hypodermically or intravenously) . .	15–20 c.c. repeated	10–15 c.c. repeated (foals 5–10 c.c.)	1–3 c.c. repeated	1–2 c.c. repeated	½–1 c.c. repeated	¼–½ c.c. repeated
Podophyllin . . .	10–30 grs.	10–30 grs.	2–4 grs.	1–3 grs.	¼–1 gr.	⅛–½ gr.
Potassium Bicarbonate	½–1½ ozs.	½–1 oz.	½–1½ drs.	½–1 dr.	10–30 grs.	2–10 grs
Potassium Bromide .	½–1 oz.	½–1 oz.	½–1 dr.	15–60 drs.	5–20 grs.	2–10 grs
Potassium Chlorate .	2–6 drs.	1–4 drs.	20–60 grs.	10–40 grs.	5–15 grs.	2–8 grs.
Potassium Iodide .	2–4 drs.	1–2 drs	10–30 grs.	5–20 grs.	3–10 grs.	1–5 grs.
Potassium Nitrate .	½–1 oz.	2–4 drs.	30–60 grs.	20–60 grs.	5–20 grs.	2–10 grs
Potassium Permanganate	—	15–20 grs.	—	—	1–2 grs.	—
Quassia, Fld. Ext. .	—	2–8 drs.	10–30 min.	5–15 min.	2–10 min.	—
Quinine Sulphate .	1–3 drs.	½–2 drs.	5–20 grs.	2–15 grs.	1–5 grs.	½–2 grs
Rhubarb Compound, Liq. Extract . .	2–8 drs.	2–6 drs.	30–90 min.	30–60 min.	15–30 min.	5–10 min
Salol	1–4 drs.	1–4 drs.	5–30 grs.	5–20 grs.	3–10 grs.	1–5 grs.
Santonin	30–60 grs.	20–40 grs.	10–15 grs.	2–10 grs.	1–5 grs.	½–2 grs.
Saw Palmetto Berries, Fluid Extract . .	1½–3 ozs.	1–2 ozs.	1–3 drs.	½–2 drs.	¼–1 dr.	10–30 min
Senega, Fld. Ext. .	—	½–2 drs.	—	5–15 min.	1–5 min.	—
Silver Nitrate. . .	2–5 grs.	2–5 grs.	½–1 gr.	½–1 gr.	$\frac{1}{10}$–½ gr.	—
Sodium Bicarbonate	½–1 oz.	2–8 drs.	½–1 dr.	20–30 grs.	10–20 grs.	3–10 grs
Sodium Nitrite . .	20–40 grs.	20–30 grs.	—	—	1–2 grs.	—
Sodium Salicylate .	4–8 drs.	2–8 drs.	15–60 grs.	10–30 grs.	5–20 grs.	2–10 grs
Sodium Sulphate .	½–1½ lbs.	1–4 ozs.	1–4 ozs.	1–3 ozs.	½–2 drs.	10–40 grs
Squill, Fluid Extract	1–2 drs.	30–90 min.	—	3–10 min.	1–5 min.	$\frac{1}{10}$–½ min
Stramonium, Fluid Extract . . .	30–90 min.	15–60 min.	10–30 min.	2–10 min.	1–3 min.	¼–1 min
Strophanthus, Tincture	1–4 drs.	1–3 drs.	10–30 min.	—	2–10 min.	—
*Strychnine Sulphate (orally)	½–1 gr.	¼–1 gr.	⅛–¼ gr.	$\frac{1}{30}$–$\frac{1}{10}$ gr.	$\frac{1}{100}$–$\frac{1}{60}$ gr.	—
,, (hypodermically).	Give the minimum doses.					
Taka-Diastase . .	—	1–2 drs.	—	—	2½ grs.	1 gr.
Tetrachlorethylene .	—	—	2½–5 c.c.	2½–5 c.c.	3–16 min.	—
Turpentine Oil . .	½–4 ozs.	½–2 ozs.	1–4 drs.	1–3 drs.	2–20 min.	—
Valerian, Ammoniated Liquid	30–90 min.	30–90 min.	15–40 min.	10–30 min.	5–15 min.	½–2 min
*Veratrone . . .	40–60 min.	30–50 min.	—	—	2–4 min.	—
Veratrum Viride, Fluid Extract . .	15–30 min.	15–30 min.	3–6 min.	2–4 min.	1–2 min.	½–1 min
Viburnum Prunifolium, Liq. Ext. .	1–4 ozs.	1–4 ozs.	2–4 drs.	15–60 min.	10–40 min.	2–10 mi

* The doses stated for this drug are those suitable for hypodermic administration.

Veterinary Posological Table—*concluded.*

Drug or Preparation.	Cattle.	Horses.	Sheep.	Pigs.	Dogs.	Cats.
Wormseed, Fluid Extract . . .	—	—	—	—	15–60 min.	5–15 min.
Zinc Sulphate (astringent) . .	—	½–2 drs.	5–15 grs.	4–10 grs.	1–3 grs.	—
(emetic). . . .	—	1–4 drs.	10–60 grs.	10–40 grs.	5–30 grs.	—

TABLE FOR REGULATING THE DOSES FOR YOUNG ANIMALS.

Doses.	Cattle.	Horses.	Sheep.	Pigs.	Dogs.	Doses.
Full dose	Over 2 yrs.	Over 3 yrs.	Over 2 yrs.	Over 1½ yrs.	Over 6 mths.	Full dose
½ ,,	1–2 years	1½–3 yrs.	1–2 years	9–18 mths.	3–6 mths.	½ ,,
¼ ,,	6–12 mths.	9–18 mths.	6–12 mths.	4½–9 ,,	1¼–3 ,,	¼ ,,
⅛ ,,	3–6 ,,	4½–9 ,,	3–6 ,,	3–4½ ,,	20–40 days	⅛ ,,
1/16 ,,	1–3 ,,	1–4½ ,,	1–3 ,,	1–3 ,,	10–20 ,,	1/16 ,,

Generally speaking, the dose for the dog is about the same as the human dose, but the size of the dog must be considered, and there are some important exceptions to this rule. Aloin must be given in larger doses to dogs than to man, and calomel in smaller. Nux vomica and strychnine must be given in much less amounts. **Doses of these drugs such as are quite suitable for man would produce toxic effects in a dog of ordinary size, and would probably prove fatal if repeated.** In the case of these drugs and of opium, the dose for the dog, and consequently for the cat, has a different ratio to the dose for either of the larger animals from that which obtains with the majority of drugs. In canine practice it is best to commence with minimum doses.

The dose for the cat is usually one-half that for the dog, although of some drugs, such as nux vomica or strychnine, the cat could only stand one-tenth the dose for a dog. Of most drugs the pig should have twice as much, the sheep and the goat three times, the horse sixteen times, and the cow twenty-four times as much as the dog. It is better to avoid giving Chloretone to cats.

Rectal doses are usually the same as those given by the mouth; hypodermic doses of alkaloids should be about one-half the oral dose, and intravenous doses one-half or two-thirds of the hypodermic dose.

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